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ORIGINAL ARTICLES.

AWAY WITH KOCH'S LYMPH!

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WHEN six months ago the telegraph operator at Berlin touched the key of his instrument and flashed to all parts of the civilized world the joyful tidings that a cure for tuberculosis had at last been discovered, the people and the profession felt that the millennium in medicine had come. For days and weeks the public press devoted a liberal space to telegraphic messages, to editorials and messages from medical men, relative to the new treatment. For months, the medical journals in all countries rivalled each other in presenting the latest reports from Berlin and other large medical centres, in the form of telegrams, correspondence, editorials and original contributions. The first announcement of the discovery brought thousands of patients and doctors to the German capital, the former to be cured of their tuberculous disease, the latter to receive instruction and to make themselves proficient in all the details of the new treatment. No other event in the world's history ever attracted so much attention and no discovery in medicine or surgery ever found such ready introduction and universal acceptation. The discoverer, the distinguished Koch, the father of bacteriology, had scored so many victories on this modern field of research that every word he uttered brought conviction. His views were promptly adopted by the most prominent physicians and surgeons in Germany and other countries, and the new treatment was applied everywhere by the best men in the profession, as fast as the precious remedy could be obtained. Within a few weeks, the most enthusiastic and encouraging reports came from scores of prominent clinics and large hospitals. Within a few months, volumes have been written on this subject, and several special works have left the press and have been translated into many languages. A new journal, devoted exclusively to the treatment of tuberculosis with Koch's lymph, has come into existence and has a good subscription-list to start with. It is true that some of the more conservative members of the profession were a little slow in accepting the new doctrine and practice, but the great majority followed the current set in motion by the great Koch and his many eminent admirers and devoted followers. It was not long, however, before the glowing accounts of the results of the new treatment of tuberculosis came at longer intervals and in a more moderate tone, and were interspersed with the reports of cases from different parts of the world in which it had proved a complete failure, and in a not inconsiderable number of cases it was charged with having caused a speedily fatal termination. Then came the timely warning of the veteran pathologist, Virchow, who showed, by numerous post-mortem examinations of patients who died while under this treatment, that death was caused by dissemination of the disease from a local focus acted upon by the lymph. The evidence proving this source of danger has been rapidly accumulating and has contributed largely toward subduing the first enthusiasm and limiting the scope of administration of the remedy. The disastrous consequences which followed the use of the lymph, perhaps often injudiciously and recklessly applied, induced a number of medical societies to condemn its use, and led some of the local governments by legal enactments, to restrain its further application. Time enough has now elapsed to judge of the merits of the treatment of tuberculosis by Koch's lymph, or, as it is now called, tuberculin. It has been put to test in the treatment of all forms of tuberculosis. Surgeons, physicians, gynecologists, obstetricians, dermatologists, otologists and ophthalmologists have given the new treatment a fair trial, and the accumulated experiences from all these sources have shown beyond all doubt that its indiscriminate use is attended with many immediate and remote dangers, and that most cases in which it at first appeared to prove beneficial have relapsed, and after weeks and months were no better or even worse than when the treatment was begun. Men who first regarded the lymph as a specific in all forms of tuberculosis no longer make this claim. Many who were enthusiastic in their praise of what they observed from the use of the remedy in the beginning have now suspended its use. Hospitals and wards set aside for the special treatment of patients suffering from tuberculosis are now deserted. The market is overstocked with a supply of Koch's lymph and Koch's syringes. Not only the profession, but also the public, has become aware that the claims made for the remedy only a few months ago are unfounded. It is left for Koch, or some future investigator, to discover a substance or agent which

will answer the expectations that were at first entertained from the lymph. Koch's lymph has been a deceptive bubble which for a short time commanded the attention and admiration of the whole world, but which has been ruthlessly pricked by the father of modern pathology. The treatment of tuberculosis with Koch's lymph and the numerous substitutes which have recently been forced on the attention of the profession will soon be only a matter of history.

My "Away with Koch's lymph!" is based upon my own observations made at the Milwaukee Hospital during the last four months' service in that institution prior to my removal to Chicago. The material is not large, but the careful observations made entitle me to enter my protest against any further experimentation with this remedy. The lymph first used I received through the courtesy of Dr. J. S. Billings, of Washington, and when this was exhausted I received an abundant supply directly from Dr. Libbertz, through the influence of my distinguished friend, Professor von Esmarch. The tuberculous nature of the lesions in all cases that came under my own care, if any doubt existed in this regard, was established by microscopical examination and search for the bacillus. As lupus of the face was mentioned in the first reports from Europe as having been cured with Koch's lymph, I was exceedingly anxious to commence treatment with this form of surgical tuberculosis.

In all of the cases treated, the local and general reactions were typical and corresponded with the descriptions given by von Bergmann, von Esmarch and others. As a rule, the injections were made every other day in order to ascertain the full extent of the local and general reaction following each dose of tuberculin. The first dose never exceeded one milligramme; in grave cases the treatment was commenced with one-half of this quantity. The dose was never increased if the temperature during the reaction following it rose above 101° F., and if this was reached, in many cases the dose was diminished or the interval between the injections increased. It is, therefore, probable that in the grave cases, the unfavorable symptoms following the injections were not so much due to the action of the tuberculin as to the intrinsic tendencies of the disease to aggravation. It is, however, an entirely different matter in the mild cases, in which, in spite of a careful increase of the dose, the local and general symptoms underwent a rapid change for the worse, because in such cases the unfavorable results must be attributed to the action of the tuberculin and not to the intrinsic tendencies of the disease. The whole number of cases treated by injections of tuberculin at the Milwaukee Hospital during the months of January, February, March and April was 43—32 males and 11 females. For the sake of convenience these can be divided into mild, medium and grave cases:

	Males.	Females.	Total.
Mild cases	8	4	12
Medium cases	11	2	13
Advanced cases	14	5	19
			44

Died in the hospital: 1 male and 1 female—2.

	Males	Females.	Total.
Aggravation of all the symptoms during treatment	14	8	22
No improvement	5	1	6
Improved	11	1	12
Apparently cured	2	...	2
Died	1	1	2
			44

Died soon after leaving the hospital: 4 males and 2 females—6.

	Males.	Females.	Total.
Of the mild cases unfavorably affected by the treatment	1	3	4
Of the mild cases improved	4	1	5
Of the mild cases apparently cured	2	...	2
			11

The two cases that were apparently cured belonged to the mild type of the disease; no such result was obtained in any of the thirty-one cases belonging to the medium or advanced form of the disease. In one of the cases that was apparently cured, the sputum contained no bacilli, and in the other there was no expectoration, consequently some doubt must remain as to the tuberculous nature of the pulmonary affection.

In the cases of medium gravity the result of the treatment was as follows:

Aggravated	5
Not improved	3
Improved	5
	13

In the grave cases the treatment was followed

By serious results in	12
By no improvement in	3
By temporary improvement in	2
By death in	2
	19

GENERAL REMARKS. *Diagnostic Value of Tuberculin.*—Great diversity of opinion prevails at the present time as to the diagnostic value of tuberculin. The first reports of the use of this substance were unanimous in attributing to it positive diagnostic value. It was claimed that reaction only occurred in tuberculous patients as a result of the specific action of the lymph on tuberculous tissue, and that the absence of increase of temperature after injection of the lymph decided the non-tuberculous nature of the affection. Leyden, Quincke, Ebstein, Weber and Biermer maintain that the absence or presence of reaction after the use of tuberculin must not in all

cases be regarded as absolute proof of the existence or non-existence of tuberculous disease. Schultze, Finkler, Guttmann, Schreiber, Lichtheim and Rumpf have great faith in the diagnostic value of the use of tuberculin in tuberculosis of the internal organs. The same discrepancy of opinion exists among surgeons as to the value of injections of tuberculin in the differential diagnosis of surgical tuberculous and non-tuberculous lesions. Bergmann relies on the reaction following the use of tuberculin in differentiating between tuberculosis on the one hand and syphilis and carcinoma on the other. Bardeleben and Kohler are reserved in their verdict as to the diagnostic value of the method. Trendelenberg regards the febrile reaction following an injection of tuberculin as an evidence of the tuberculous nature of the lesion, except in tuberculosis of the testicle. Esmarch is of the opinion that in doubtful cases the reaction following the use of the remedy is of great diagnostic value. Bramann and Mikulicz place great confidence in the presence or absence of reaction. König and Hildebrand have observed reactions in lesions resembling in appearance tuberculous affections, but which by other diagnostic aids were shown not to be of a tuberculous nature. Clinical experience has demonstrated that general reaction is produced by tuberculin in cases of actinomycosis and in certain forms of sarcomatous tumors, and that consequently this method of diagnosis cannot be relied upon in differentiating between tuberculous lesions and other affections. A number of the cases upon a study of which this paper is based furnishes conclusive proof that the susceptibility to general reaction varies greatly in different tuberculous individuals. In some, intense reaction followed the use of small doses, when the tuberculous lesion was limited; in others, suffering from extensive tuberculosis, large doses produced no rise in temperature. That in the latter class of cases the affection was of a tuberculous nature there could be no doubt from the history of the cases, the appearance and location of the lesions, the subsequent behavior of the affection; and in some of the cases the presence of tubercle bacilli in the affected tissues was demonstrated. I look upon the local reaction in affections of the lymphatic glands as a valuable diagnostic aid in differentiating, by the use of Koch's lymph, between tuberculous and non-tuberculous affections of these organs. If the enlargement of the lymphatic glands is due to a tuberculous affection, the existing swellings not only become larger, more painful and tender a few hours after the injection of a dose of the lymph, but other glands, that could not be felt before the injection, become enlarged and can be felt in the vicinity of those that were recognized before the use of the remedy; but even in such cases, I regard inoculation experiments of greater diagnostic value than injections of tuberculin, yielding more positive results without exposing the patient to the risks of local and metastatic dissemination of the disease incident to the latter procedure. If on the one hand patients suffering from non-tuberculous affections will occasionally only respond to the tuberculin test, and on the other hand, in exceptional cases, individuals suffering from well-marked typical tuberculous affections have proved refractory to the action of tuberculin, it must appear evident that the use of this substance cannot be relied upon in making a positive differential diagnosis between tuberculous and non-tuberculous affections. At the same time, if it can be shown that a single injection of tuberculin is not devoid of danger, and that implantation of the product of this disease in guinea-pigs will in the course of three or four weeks yield results which will enable us to make a reliable diagnosis between tuberculous and non-tuberculous affections, it is apparent that the use of Koch's lymph as a diagnostic resource should be discarded, or at least limited to exceptional cases.

Therapeutic Value of Tuberculin.—It is now generally conceded that many cases of tuberculosis reported as cured have since relapsed; some of these have died, and others have been subjected to different treatment. In many instances, of course, the original report has not been supplemented by subsequent communication. Since, even by the use of Koch's lymph, an absolute diagnosis is not always possible, it may be that some of the alleged cures rest on a faulty diagnosis. This applies with especial force to the two cases of pulmonary disease reported in this paper as cured. Again, it must not be forgotten that under favorable local or general conditions or improved dietetic, hygienic or climatic changes, tuberculous affections not infreqently undergo spontaneous cure, so that for nearly all methods of treatment so far suggested similar exceptional results can be claimed. Of the eleven cases of surgical tuberculosis that came under my own observation, in not a single instance did the treatment result in more than temporary improvement, and in several it was followed by local extension of the disease and serious impairment of the general health. The effect of tuberculin proved more serious in the treatment of the forty-three cases of pulmonary tuberculosis. There can be but little doubt that in a number of the fatal cases death was hastened by the treatment, and that in a number of the mild cases it contributed largely toward the rapid local extension of the lesion. While the tuberculin treatment of pulmonary tuberculosis can show no better results, it is difficult to ignore the fact that it has been productive of more harm than almost any other plan of treatment heretofore suggested, and on this score alone the verdict,

"Away with Koch's lymph!" is timely and imperative.

Dangers Attending the Use of Tuberculin.—Tuberculin when brought in contact with tuberculous tissue produces coagulation necrosis, and during this process a toxic chemical substance is produced, which, when it reaches the general circulation, causes the febrile action. The time necessary to reach this stage of its action is usually from three to six hours. The intensity of the reaction depends on the quantity of the toxic substance that is produced and finds its way into the general circulation. The general reaction is evidence of a septic condition of the organism produced by the toxic substance resulting from the action of the tuberculin on the tuberculous tissue. The evidence of temperature and the other general symptoms continue until this toxic substance is eliminated by one or more of the excretory organs. The immediate danger attending the tuberculin-treatment consists in the production and introduction into the circulation of a fatal quantity of this toxic substance. That the fear of fatal sepsis resulting from the action of Koch's lymph is not unfounded is shown by a number of such cases that have been reported. If the whole truth were known, this number would be greatly increased by unpublished cases. The more remote dangers attending the tuberculin treatment have been pointed out by Virchow. The destructive effect of the tuberculin on the granulation tissue breaks down the wall surrounding the infected area and liberates the bacilli and their spores—an event which can hardly fail to give rise to local and general dissemination. The granulation tissue, the specific primary product of tuberculous inflammation, is the wall of defence built up by the tissues to protect the adjacent parts and the organism against invasion. Any method of treatment interfering with this mode of defence clears the way for the enemy and secures victory for the invading army. If future research should lead to the discovery of a specific remedy for the cure of tuberculosis, it will be a microbe antagonistic to the bacillus of tuberculosis, or a substance which, when brought in contact with a tuberculous focus, will have an effect on the tissues opposite to that of Koch's lymph.

I have given Koch's lymph a fair trial and have carefully observed its effects, and I have become firmly convinced both of the danger attending its use and its utter inutility in curing any form of tuberculosis.

This paper has been written for the special purpose of placing myself on record as one who protests earnestly against further experimentation with this mysterious and dangerous fluid. A careful study of the voluminous literature on the use of Koch's lymph, and my own experience with it, have induced me to head this paper with the title it bears, "Away with Koch's Lymph!"

FURTHER STUDIES IN MALARIAL DISEASE.

The Parasites and the Forms of Disease as Found in Texas.

BY GEORGE DOCK, M.D.,
OF GALVESTON, TEXAS.

(Concluded from page 606.)

The Small Plasmodium.—During the season under consideration I have learned to recognize another form of the parasite of malaria, and one that is for many reasons the most important of all. Certainly from the point of view of pathogenesis and prognosis it cannot be overrated. As the description which follows makes clear, this is the form so thoroughly described by Marchiafava and Celli as the "small form" (*piccolo forme*), and which is found in the fevers which predominate in the summer and autumn in Rome.

Not having access to the proper literature I had ended my investigations on these bodies, when, through the kindness of the authors, for which I cannot sufficiently thank them, I received reprints of their articles, translations of which appeared still later in various German journals.

The reason I did not learn earlier about these bodies is that in previous seasons they occurred but seldom, and always with the large forms. In the unusually severe epidemic of the last autumn I encountered them in twenty-six cases, in only three of which the large forms were also found. In twenty-three cases only the small forms, and in some cases crescentic bodies, were found.

In eighteen of the twenty-three cases I was able to make observations at frequent intervals before, during, and after treatment, and in two cases *post-mortem*.

My attention was first called to these bodies by the peculiarities of their pigment, a matter to which I have long paid particular attention. I found a number of cases in which the plasmodia never became large, but beginning as small unpigmented bodies they grew, with characteristic amœboid movements, and formed pigment, usually in very fine granules. Becoming larger, though never more than one-third the diameter of a red corpuscle, the pigment became gathered in a roundish or irregular mass. This was the last seen of the bodies. Disappearing from the blood their place was taken in a short time by the smallest forms, and so the process was repeated.

I might have remained in ignorance of the later stage, had it not been for the occurrence of a fatal case in which only these forms occurred, and in which, owing to the short duration and severity of the disease, they could be studied alone and to great

advantage. I intend to publish the case in full, with histological studies at another time. It is sufficient for our present purpose to say that the patient, a man of twenty-three years, was sick for a few days, having been exposed in a very malarial locality. On admission the patient's condition did not seem alarming; the history pointed to a continued fever rather than to an ordinary malaria. At the first examination of the blood, however, the diagnosis of pernicious malaria was made, with a fatal prognosis, and in little more than a day the man was dead. The blood was examined for many hours, including two paroxysms, but no segmenting forms were seen. Death occurred as the forms were attaining the maximum size. At the autopsy segmenting forms were found in enormous numbers in the brain, spleen, kidneys, and some other internal organs. None were found in the peripheral blood. The segmenting forms were completely developed. In some cases they were still in the red corpuscles, in others free. They were of great regularity in appearance, having the pigment in or near the centre and from ten to fifteen or eighteen spores around it. They seemed in fact to be more regular in their arrangement than the large plasmodia. This may have been due to their small size preventing us from seeing variations such as have been described of the others.

So far as one can learn without actual comparison, this is the "small form" of Marchiafava and Celli. I did not, however, see all the varieties described by those observers—the one, for example, in which the hæmoglobin of the red corpuscle is gathered in a ring around the parasite,[1] I have never seen, nor have I been able to find plasmodia in the shrunken red corpuscles, so common in this infection.

I have never seen the larger stages without pigment. In many instances numbers of plasmodia without pigment were seen, but in such cases pigmented leucocytes or crescents showed the pigment-forming stages to be present somewhere in the body.

In the twenty-three unmixed cases typical flagellate bodies were never seen. Free bodies were frequently found, though not so often as with the large plasmodia. In one case a filament was seen on a free body, and in the spleen of the fatal case another was found, but neither had the sharply cut outlines and homogeneous appearance of the flagella found with the large forms. It may be believed that, after my statement in regard to the frequent occurrence of flagellates, I spared no pains in looking for them in these cases, but the conviction was forced on me that they were not present. On the other hand, I had opportunities for studying another form equally interesting—the crescentic body of Laveran.

The Crescents.—The origin, nature, and development of these bodies is still involved in obscurity. Much of this depends on a misconception of their actual appearance, as may be demonstrated by the statements still current that they are altered red blood-corpuscles, and from the descriptions and figures given by some writers.[1] Though I cannot hope to clear up the obscurity, I have certain facts to advance which may help to do so.

During the last season I have found crescentic bodies in twelve cases, as follows: In five cases with the small plasmodium only, in three with small and large forms, and in four (in the finger blood) alone.

The presence of the pigment shows that the crescents are derived from organisms which destroy the hæmoglobin. No one as yet has seen the complete cycle, owing to our imperfect methods of studying the organisms. The method of Plehn promises to be of value.

In all cases but four—and these I shall examine critically later—in which crescents were found in this series, the small plasmodium was found also. To believe the crescents are derived from bodies entirely similar in appearance, yet differing essentially from these in nature, as the alternative hypothesis assumes, seems quite unwarranted. Moreover, in two cases I have found the bodies held to be the intermediary forms by Marchiafava and Celli. These were as follows:

C. W., a laborer in a malarial part of Galveston, admitted to hospital October 22, 1890. Patient said he had fever, without chills, for two weeks in May, and has never been well since. For six days has had pain in back and fever without chills. Temperature at 9 A.M., 100.4°. Spleen enlarged; great anæmia.

The temperature rose in the next two hours to 106° without a rigor, and then fell, on the administration of antifebrin in one large dose, with copious perspiration.

1.30 P.M., temperature, 104°. In the blood many small amœboid endoglobular forms without pigment. A few pigmented leucocytes.

Later in the afternoon small pigment grains began to appear in the plasmodia. The temperature reached the normal at midnight and then rose slowly. The organisms in the blood were larger and contained more pigment. The approach of a paroxysm was predicted at 11 A.M. No sign of a rigor appeared, though the temperature rose to 102° and the larger of the plasmodia disappeared, to be followed in about three hours by the appearance of many small forms. Quinine was given in three doses of ten grains each during the night, but the temperature, instead of falling, rose slowly.

24th. Many plasmodia, pigmented, in the blood.

[1] Arch. per le Sci. Med., xiv., No. 8, Fig. 14; also, Fortschritte der Med., Bd. ix., No. 7.

[1] Cf. Dolega, l. c., Taf. v., Fig. 8.

In the afternoon they began to show the later stages of development, with the pigment in one large mass. About 2 P.M. these disappeared, and only small, unpigmented forms were found. At 5 P.M. the supposed developing crescents were found in considerable number. These were oval, or thick, spindle-shaped bodies, with pigment in short rods scattered through them. Usually they were in the middle of the affected corpuscles, with the ends reaching the opposite sides; but in some cases they were on one side, and then showed a curved shape corresponding to that of the corpuscle. The bodies had clear outlines, were more highly refracting than the plasmodia, and sometimes of finely granular structure, like that of the crescents. Changes in form were slight and took place slowly. Temperature, 105°.

25th. Patient had thirty grains of quinine during the night. Temperature at 10 A.M., 99°. In the blood a few small amœboid plasmodia and spindle-shaped bodies as before. The patient was by this time thoroughly cinchonized, and the temperature fell gradually to below the normal. No more spindle-shaped bodies appeared, though a few small amœboid forms could be found.

29th. The patient left the hospital, having taken three drachms of quinine.

November 27. Patient returned. States that he was well for two weeks after leaving, but that for the last twelve days he has had chills daily.

4 P.M., temperature, 102.4°, rising to 104.4° at 7, and remaining up until next morning at 10, when the blood was examined. This showed many small amœboid forms, such as are found after a paroxysm. Owing to the number of plasmodia and the prostration of the patient, quinine was given at once to the point of cinchonization.

29th. Temperature, 97°. In the blood a few pigmented leucocytes; no plasmodia.

The temperature rose for two days to 101°, then remained below normal, and the patient again left the hospital.

In the case of C. S.,[1] at the first examination a number of spindle-shaped or oval bodies similar to those described were found, in addition to the ordinary forms of plasmodium. In some instances the arrangement of the pigment in the former approached that common in the crescents, having a central position. Next day the patient was cinchonized; there was no paroxysm. The blood showed no plasmodia, but a few crescents, many of them remarkable for their slight curve and sharp ends, but almost all having the line or band on the concave side. In several the pigment was scattered along the whole length.

In the case of Th. C. (l. c.) crescents appeared on the third day, after the plasmodia had disappeared with cinchonization. They, too, were often peculiar in the arrangement of the pigment, often having it at one end.

A remarkable case in which crescents developed during the time of observation was the following:

"A. C., living in Galveston and working in the harbor, admitted November 26, 1890. Present illness began about November 1st, with constipation, loss of appetite and chill, and continued until admission. Chills were not regular, but usually came on when weather was bad, and generally about sunset. Has taken no medicine; spleen enlarged; anæmia.

"In the blood only unpigmented plasmodia were found, some of them as much as one-third the diameter of a blood corpuscle—that is, almost the full size of this form.

"The temperature rose to 101.6° at 10 P.M. without a chill.

"*27th.* Temperature at 11 A.M., 100.6°. Patient feels shivering sensations. In the blood are small amœboid plasmodia, pigmented leucocytes, and free crescents.

"The temperature remained at the point indicated until the morning of the third day, when it fell to normal within three hours, but at once rose to 100.4°. The organisms had persisted as before. Quinine was then given; the temperature fell after the administration of fifteen grains and did not rise again. Plasmodia disappeared in a short time, but crescents could be found until the patient left the hospital, a few days later."

The fact that crescents are sometimes found alone in the blood has led to the supposition that they represent a distinct species, capable of reproducing their like, though no direct proof has yet been advanced. One of my four cases with crescents only gave an opportunity for learning the possibility of a fallacy in the supposition stated. The case is as follows:

J. McG., of Galveston, express driver, admitted to hospital December 15, 1890. Patient stated he had had chills for two or three days, with fever and dull headache. Temperature at 3 P.M., 99.6°.

December 16, 6 A.M. Temperature, 100°. Soon after this a chill; patient became comatose; urine examination negative.

12 M. Patient cannot be roused; pupillary and corneal reflexes abolished; face flushed, with tinge of yellow; splenic dulness enlarged, but the organ cannot be felt.

Blood pale, watery; leucocytes increased, especially the large lymphoid corpuscles. Many crescents but no other forms.

12.45 P.M. Spleen aspirated by a hypodermic syringe below the eleventh rib, the needle pointing upward; needle moves with respiration. The blood withdrawn shows many amœboid bodies of all sizes, including some in the later stages, with a single large pigment mass; many crescents and pigmented leucocytes. The crescents nearly all show the membrane on the concave side, which those in the finger blood do not. The membrane is very easily seen; sometimes is wrinkled. The most remarkable feature about the crescents is their excessive curve. The width across the horns is not greater than that of a red blood-corpuscle, the arc being about two-thirds of a circle.

The subsequent history of the case can be condensed in a few words. Quinine was given in large

[1] Fortschritte der Med., No. 5, 1891.

doses—forty grains daily—hypodermatically. Strychnine was also used in the same way, and mustard foot-baths given. The temperature did not begin to fall until 7 P.M., five hours after thirty grains of quinine had been given. It then fell to normal. The pupils then reacted to light, but the patient could not be roused. Forty grains of quinine were given during the night, hypodermatically.

Next morning, 17th, at 10 o'clock, the temperature rose rapidly at first and by 4 o'clock reached 102.4°, when it began to fall. Up to this time the finger blood showed the same characteristics as at the first examination. During the night the patient had forty grains of quinine injected as before.

18th. The blood examination showed no change. The temperature rose from 97.4° to 98.8°. At night twenty grains of quinine.

19th. Patient still comatose, but reacts to pin-thrust. In the blood a few crescents; no pigmented leucocytes. Temperature rose from last night to 4 P.M., reaching 100.2°, then fell next day to sub-normal.

20th. Patient's mind was clear. Temperature normal. There was muscular weakness and anæmia. In a few days the man left the hospital, feeling quite well.

In this case none of the supposed transition forms of the crescent were seen. In all instances the affected blood corpuscle was entirely decolorized, though the complete membrane could not be looked upon as anything but its shell.

All the facts I have brought forward do not prove the origin of the crescents from the small plasmodium, but in view of the improbability of any other explanation of their origin that has been given up to this time, the suggested source seems very probable.

It has been asserted that the crescents undergo sporulation, giving rise to small amœboid bodies. This seems very probable, though proof is wanting. All my own efforts to observe such a process have been negative.

Equally negative have been my efforts to see another process often described—the formation of flagella on crescents or their degenerated bodies. In all of my many observations made with that object, the results have been almost identical. The crescents become oval, with double contours, then round, and finally break down into hyaline masses. Some of the common flagellate bodies have a distant resemblance to the rounded crescentic bodies.

In speculating on the nature of the crescents it seems to me we have allowed ourselves to be misled by two things—the form of the organisms and their resistance to quinine. In regard to the former, the name alone has been the cause of misconception with some, who have forced a parallel between these and the crescentic or sickle-shaped spores of the coccidia—certainly with very little reason.

As for quinine and its effects, we must bear these facts in mind: It has been demonstrated that the various forms of the plasmodium other than the crescents differ in their resistance. Thus the larger forms and those with flagella are more resistant than the smaller stages of the same kind.

Again, the small plasmodium, as shown by the researches of Celli and Marchiafava, and confirmed by me, is more resistant in all its stages than the large form. If now the crescents are derived from the small forms we have some ground for assuming their greater resistance. There is still another possibility to be considered. We have seen that there is a stage, even of the most easily affected form, which resists the action of quinine for long periods, and is then capable of giving rise to new generations. We must, therefore, consider the possibility of the similar stages of the small plasmodium, probably true spores, having a proportionately greater resistance, and we can easily see, from the last case quoted, how the intermediate stages of the development could be overlooked in the usual method of investigating.

The cause of the final disappearance of the crescents is unknown. They certainly are not often taken up by phagocytes in the peripheral blood. In the case of Th. C., after appearing in the course of the observations they soon disappeared. This would seem to show that their development had been checked at an early stage, a stage more easily influenced than the later ones or the spores.

For the present I feel justified in looking on the crescents as representing a phase in the development of the small plasmodium, and while accepting the possibility of their sporulation and producing flagella, I do not consider it a common or necessary part of their existence.

Clinical Features of Cases with the Small Plasmodia and Crescents.—The cases in which the small plasmodia occur have certain peculiarities which distinguish them from those accompanied by the large form. They are the cases described by authors as remittent or sub-continued, or even by some as continued, and a full description of which at this time would be superfluous.

Intermissions do take place. In six out of eighteen of my cases—before the administration of quinine—there were intermissions, but in these cases the apyrexia was of very short duration and the cold stage less distinct than in the paroxysms of the common intermittents.

In these cases there are also anomalies in the duration of the hot stage, which is sometimes unusually long, and not always followed or accompanied by copious sweating.

The fever curves in remittent cases present the greatest irregularity. The rise may be sudden, or may be slow and uncertain. In them rigors are absent. The patient may not feel cold at any time, or may complain of a feeling as if a soft breeze were blowing over some part of the body. The acme may be short or may last over a day (in one case at 104°). The fall may be rapid, but is usually slow. The difference between lowest and highest temperature varies from two to five (100°–105.5° in one case) degrees, but is usually between three and four.

Quotidians are the rule. In two cases a tertian curve was caused by remarkably slow fall and subsequent rise, the apyrexia or remission being of very short duration.

In two of the eighteen cases the curves were so atypical as not to give an intimation of their malarial nature. One was the case of A. C., already detailed. The other was that of a young man working on the wharves, who gave a history of diarrhœa, vomiting, headache, and dizziness for three weeks, without a chill, with fever for seven days. There was slight anæmia and the spleen was enlarged. The blood showed small plasmodia and crescents. The patient remained in the hospital four days, the temperature ranging between 98° and 100°, and the diarrhœa having been checked, he left, with the blood as before.

Symptoms, sometimes of great severity on the part of the stomach, brain, and other organs, have always been present in my cases. The cases are too few to serve as a basis for comparative diagnostic points. They agree closely with the descriptions, especially of those who have given us the best accounts of tropical malaria.[1]

In many cases, not only from the anamnesis, but also from the symptoms and the temperature curve, it would have been difficult to distinguish between malaria and some other infection—for example, enteric fever. It is important to note that in none of the cases in which such doubts could have arisen, and in which the microscopic diagnosis of malaria was made, did quinine fail to be followed by a fall of the temperature to normal or below, usually within two days, sometimes in three or four, with cessation of all symptoms except those due to anæmia, and with subsequent recovery.

I hold, therefore, that the ability to recognize the true nature of certain of our fevers by the microscope is of great practical advantage, and should be applied when possible, and that in the scientific study of these fevers, to ignore the plasmodium is to make our conclusions impotent.

In regard to the cases in which crescents occur, my experience agrees with that of Laveran and of Celli and Marchiafava. Though most constant in cases of advanced malarial anæmia, they also occur, as the foregoing pages indicate, in cases of comparatively short duration, and in which the term cachexia could hardly be applied.

The blood in cases showing the small plasmodium is in certain respects remarkable. In the first place, one does not see the large, pale, flattened corpuscles so common with the other forms, but the corpuscles are often smaller and darker. Poikilocytosis is very common, especially the internal alteration causing the so-called vacuoles. The latter, it may be observed, can never be a cause of confusion to the practised observer.

The most marked feature in the blood in these cases is the regularity of appearance and number of the pigmented leucocytes. Out of 26 cases with small plasmodium they were found 14 times, and of the other cases 5 were seen but once, and the rest were of short duration, in which the disease was soon jugulated. In most cases they were very numerous. The pigment was usually in roundish masses, and evidently derived from the matured segmenting bodies. Frequently one leucocyte could be seen with several such masses. The leucocytes that were so affected were almost all large ones, evidently endothelial in origin.

Decrease in the number of red corpuscles and increase of leucocytes, especially the large lymphoid corpuscles, is a common feature of the blood in these cases, and, in those showing pernicious features leucocytosis may be intense (1 : 5 in one of my fatal cases).

I have described the various organisms as they occurred in all but one of the 41 cases which came under observation last year. I preferred to speak of this case by itself, on account of its peculiarity. The clinical history has been given in the *Fortschritte der Medicin* (loc. cit., J. B.), and need not be repeated. It was a case of atypical malaria, with a history of continued fever, but the one paroxysm observed in the hospital was preceded by complete apyrexia. The organisms were very numerous. Examined in the acme, they were peculiar in that the segmenting forms were of great regularity. They were about two-thirds the diameter of a red corpuscle, with the pigment in the middle, and six or eight round or oval spores around it. Unfortunately, I could not get dried preparations, and, as it was necessary to cinchonize the patient, no further observations could be made.

The Relation of the Different Forms of Plasmodium to Each Other.—As has been shown by the foregoing, there are a number of forms of the organism which vary widely in appearance, mode of growth, and type of disease they accompany. Are we to look on

[1] See Schellong: "Die Malaria-krankheiten, etc.," for interesting remarks on this Protean disease.

these as being all members of a polymorphous species, or are there different species or genera?

Evidently this question cannot be definitely decided until we have more accurate methods of studying the parasites. The experiments of injecting blood from various kinds of cases, as practised by our Italian colleagues, have had contradictory results. This is all we could expect in view of the sources of error in such experiments. The disproportion between the amount of blood injected and even the largest quantity that one could examine is so great that certain forms might be overlooked. Or, it might be that the spores of one form could be circulating in the blood, but, on account of a temporary or permanent immunity, not be able to reach full development, and yet in another host rapidly perform their full cycle, with the result of impressing their peculiar features on the disease.

The reasons for believing in the existence of different species (genera?) are, in short, as follows:

1. The different forms may exist by themselves, or combined, but in the latter case no transition from one to the other can be seen, but both continue distinct.

2. Either form may accompany cases of malarial disease of atypical course and symptoms, but in cases which show pernicious features the small forms are always to be found.

The forms I have described explain all cases of malaria in which they occur. The large form with the tertian or quotidian intermittents and some mild atypical cases; the small form with usually quotidian cases, almost always atypical in symptoms, and often pernicious.

This does not exclude the possibility of a distinct form for quartan fevers. Never having seen a case of that kind, I cannot consider it particularly, but must look on it as a necessity. I also believe there may be other varieties. At the same time I think we must accept the view that the active life of any one generation is not in a fixed relation to the daily rotation of the earth, but liable to variations.

The belief in the existence of various species or genera of malarial parasites does not essentially alter the view usually held as to the unity of malarial disease, but gives scientific ground for explaining certain clinical facts which, under other suppositions, have always been difficult to understand. This applies to cases of pernicious malaria especially.

To conclude, then, the special object of this communication, we find in a certain number of malarial localities of wide geographical distribution a number of kinds of parasitic organisms. We find, also, that these agree, in appearance and mode of development, with the organisms found in similar classes of cases in other parts of the world, especially with those found in temperate climes, like Germany and the northern United States, and those with tropical temperatures, if not latitudes—Italy and Algiers.

It does not enter into the scope of this paper to consider the pathology of malaria, yet there are certain points in regard to it on which a word may be said. It has been stated that the discovery of the plasmodium malariæ does not clear up our knowledge of the disease. Such statements show an unfamiliarity with the subject. One of the most marked morbid changes in malaria, destruction of red blood-corpuscles, with formation of melanin, can be followed from beginning to end under the microscope. In a case of pernicious fever the extent of this is so great as hardly to be believed, unless one sees the fact. It is sometimes said that the segmentation of the parasites explains the paroxysms. Mechanically this is difficult to understand. Nor do the results of pathological investigations make this clearer. The formal occlusions of vessels by the parasites and the congestions of various internal organs explain certain symptoms; but in the cases with the most marked intermittent course we have no reason for believing that these are prominent factors. It is difficult to believe the remarkable symptoms in pernicious cases are due to the effects of the bodies acting mechanically on the nerve centres. Many of them point strongly to the action of chemical substances. There are certain facts known which lend strength to such a supposition. Many protozoa have the power of dissolving cellulose, woody fibre, and starch, and of coagulating albumin. Krukenberg has discovered a peptonizing ferment in *fuligo varians*. All the parasitic monads living in certain plants produce a substance, probably an acid, which alters the color of chlorophyl, and many produce substances which completely decolorize the pigments of their hosts.

Metchnikoff and his pupils have shown that though the protoplasm of protozoa gives an alkaline, the fluid in the vacuoles gives an acid reaction.

The rapid digestion of hæmoglobin and its transformation into the bodies of the plasmodium and melanin is evidence of powerful metabolism. Can we believe that no other substances result from this? On the contrary, it seems as if such processes must necessarily result in the production of chemical substances capable of powerfully affecting the organism in which they are formed. Such substances would be excreted by the usual organs, and it may even be that the vomiting so common in the paroxysms of malaria is due to an excretion by the stomach similar to that which we know occurs with morphia.

Chemical examinations of the blood and excretæ should throw a light on this subject. The only investigations of the kind I can find are those of

Roque and Lemoine.[1] They examined the urine of one case of tertian intermittent, and of two cases of malaria acquired in Algiers, in which albuminuria occurred in consequence of alcoholic excess, and recurrences of the malaria took place in France.

The authors' conclusions are as follows:

"Malaria produces a large quantity of poisonous products; these are excreted mostly by the urine, and the excretion reaches its maximum immediately after the paroxysm.

"Sulphate of quinine favors and increases this excretion.

"The severity of the paroxysm and certain pernicious forms stand in reverse proportion to the quantity of excreted toxine, and appear in consequence to depend on disturbances in the liver and kidneys.

"The disappearance of the paroxysm is probably dependent on the quantity excreted, in the sense that an energetic excretion appears to precede the end of the disease."

Nothing is said in regard to the nature of the toxic body or the mode of detecting it. I think, however, it is not claiming too much to say that such investigations will explain the pathology of malaria, in all the details not yet cleared up, by our knowledge of the pathological anatomy in connection with the development of the plasmodium.

A communication like the present one is of little value by itself. If, however, it lead to other investigations on the same or improved lines, our knowledge and control of one of the banes of our existence will be materially increased.

THE DIAGNOSIS OF TRAUMATIC LESIONS IN THE CEREBRO-SPINAL AXIS, AND THE DETECTION OF MALINGERING REFERRED TO THIS CENTRE.

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THE counterfeit cannot be detected without an accurate knowledge of the genuine, and, in addition to this, an exact knowledge of the counterfeit, together with a definite knowledge of the difference between the genuine and the counterfeit, is still imperatively required.

It therefore follows that whoever would attempt the detection of malingering should always be able to diagnosticate concussion of the brain and spinal cord. The proper performance of this task requires a full knowledge of the etiology, semeiology and pathology of the morbid condition under consideration. Let us therefore direct our attention to these essential factors of diagnosis, carefully analyzing each in order that we may more thoroughly comprehend their relation and bearing on each other. It is universally admitted that concussion of the spinal cord most commonly follows falls upon the feet, the buttocks, and less frequently upon the hands when both arms are out-stretched; gunshot wounds involving portions of the spinal column; a stroke of lightning; heavy blows delivered over the bones of the pelvis or in the line of the spinal column.

The direct effect of these falls and blows is the production of contusions of the soft parts, etc., which are more or less disorganized by these traumatic agents. The force of these agents is not by any means entirely expended in the production of these contusions, but there will be carried along the bony structures a vibratory motion which will also be imparted in varying degrees to the adjacent soft parts. A very fair idea may be gained of these vibratory movements by placing the hand on the apex of a bell, suspended in the air, while its base is struck with a metallic hammer; or by the touch of a properly keyed string of a musical instrument when it has been put in motion. The same vibratory motion may also be very well illustrated by tapping gently with the finger on a glass jar or other vessel which is partially filled with jelly and then watching the tremulous movements imparted to the contents by the slight blows delivered on the vessel. The attention of the medical profession has been frequently called to the peculiarities of concussive or vibratory force by French authors, but its physiological and pathological action has never received that careful study to which it is entitled. A very important factor which presents itself for our consideration in connection with the study of this force is the fact that it is not transmitted equally well by the various organs and tissues of animal bodies; and, consequently, a direct blow delivered on one part of the body may be entirely negative, or result in the production of very little vibratory action, while on another part of the organism the results will be very marked. Thus a blow delivered directly on the nates will give rise to this concussive force and be transmitted along the spinal column to the bony walls of the skull, and from this structure to the brain itself, which is in such close contact with these bones. A portion of the same force will likewise be expended in varying degrees on those organs in intimate contact with this line traversed by the traumatic agent. The functional disturbances and the pathological changes in the various organs will depend on the physiological functions, weight, texture, etc., of the parts involved, and these need not be enumerated here.

A blow delivered on the feet, while the lower extremities are extended, will be transmitted to the

[1] Recherches sur la Toxicité Urinaire dans l'Impaludisme. Rev. de Méd., 1890. Centralbl. f. Bakt., etc., ix. p. 353.

bones of the pelvis and then along the spinal column. A somewhat similar result may possibly be produced by a fall on the hands when the arms are extended; though the force of this blow will be much diminished by reason of the anatomical differences in the parts, particularly the less intimate connection between the bones of the arms and the spinal column than exists between the bones of the lower extremities and this important highway for the transmission of concussive force. It should likewise be remembered that the more concentrated the direct traumatic force, *i. e.*, the smaller the area to which it is applied, the greater will be the amount of concussive force generated, while the other factors remain unchanged. Thus a blow covering an area of four square inches delivered directly over any part of the spinal column will generate far more concussive force than it would if spread over the whole posterior region of the body. In fact, in the former case, if the blow was a severe one, functional derangements and pathological lesions might rationally be expected to follow from the concentrated nature of the concussive force, but in the latter they will be looked for in vain. There is a very marked difference between the concussion in the case of gunshot wounds produced by musket or rifle balls and that which follows heavy blows or falls; in the former the pathological changes are more circumscribed, while in the latter they may be considered general. Thus, a musket ball having found lodgement in the vertebral column, and in some degree having impaired its outer surface without producing any lesion of the osseous tissues within the canal, the spinal cord will frequently be found in an ecchymotic state at a point near the lesion in the spinal column. In connection with this subject, it may be stated that no single blow, however great its momentum, delivered on the anterior surface of the thorax or abdomen could rationally be expected to produce concussion of the spinal cord, since its force would be expended almost entirely on the visceral organs within these cavities. The study of the effects of lightning, and likewise those of electrical currents of both high and low degree of potency, possesses very great interest for the surgeon in connection with the consideration of concussive force.

The vibratory character of electrical currents is apparently identical with the other forms of concussive force; and it is readily demonstrable that the physiological action, functional disturbances and pathological changes possess essentially the same characteristics. The fact has long been recognized by the ablest authorities that concussion is physiologically indicated by a nervous and circulatory excitation or depression. In accordance with this opinion Verneuil has given the following definition of concussion: "A series of phenomena more or less sudden followed by a mechanical disturbance of the anatomical elements, tissues, and organs, characterized by a temporary excitation or a depression of the functions of the parts disturbed, and likewise producing anatomical changes, are generally observed in cases of functional activity or repose." Mechanical concussive force, like lightning strokes and electrical currents, may produce every possible degree of concussion, varying from the slightest functional disturbances which pass off within a few seconds, to instantaneous death. Further similarity in the effects of these agents is shown by the fact that concussion and even death may be produced by rapidly repeated mechanical blows or a rapid succession of electrical strokes, while a single impulse would be scarcely sufficient to cause even temporary functional disturbance. The pugilist knows that to render his antagonist unconscious the blows should be delivered upon the head. He therefore seeks to deliver in rapid succession blow after blow until his object is accomplished. Experimentation on animals has shown that concussion of the brain may be caused by slight taps with a hammer delivered on the head in rapid succession.

In our consideration of the etiology of concussion of the cerebro-spinal axis we have said little in regard to its causation in the brain. It is probably understood, however, that those agencies which have already been mentioned are the important factors in its production in this organ as well as in the other organs of the body. The same general laws pertaining to the etiology of this morbid condition are as applicable here as elsewhere, consequently a blow delivered on the head will be more efficacious in the production of concussion of the brain than would be the concussive force had it been transmitted to this organ from some other part of the body. Furthermore, the weight of this organ and its other anatomical peculiarities must receive due consideration.

In the attempt to describe the symptoms of concussion in the cerebro-spinal axis we immediately encounter a difficulty arising from the fact that the functions of these organs are materially different, and consequently the symptoms observed in connection with a traumatism in the spinal cord will produce entirely different symptoms from those found when a similar lesion exists in the brain. The remedy for this difficulty is very simple and only requires that the symptoms be separately noted as they pertain to lesions in the different organs. A much more serious obstacle is found in the combination of all sorts of injuries with those of *pure* concussion, especially those having their origin in fractures, dislocations, sprains, rupture, and stretch-

ing of ligaments, particularly in the spinal column, and likewise with the concussion in one organ the symptoms of which are erroneously attributed to this morbid condition in another. In illustration of the above-mentioned error, I desire to call attention to the fact that hæmaturia is frequently mentioned as a symptom of concussion of the spine, while I have conclusively shown by my experiments on animals that it bears no constant relation to lesion of the cord, but, on the contrary, following concussive accidents, *indicates a concussion of the kidney.*

Furthermore, visual changes are frequently attributed to concussion of the spine, although as a matter of fact the lesions on which these changes depend are situated either in the brain or the eye. I am now prepared to assert that the greater part of the organs within the thorax and abdomen are equally as liable to suffer from concussive force as the brain itself; and likewise that concussive accidents are much more frequent in these visceral organs than in the spinal cord. This assertion is based on the fact that these lesions are entirely analogous to those observed in the brain, merely requiring that the proper allowance be made for differences in weight, texture, etc., factors which must be taken into consideration in connection with the study of the lesions of concussion in the brain and spinal cord. Furthermore, every true concussion takes its origin in the same peculiar force. Therefore, if it be desirable to speak of concussion of the brain, spinal cord, etc., why should it not be applied to the lungs, liver, kidneys, etc.? Would it not be absurd to speak of gunshot wounds of the brain and spinal cord, while the term is withheld from analogous lesions caused by the same peculiar force in other parts of the body? An attempt has recently been made to employ the term "nervous shock" instead of concussion; but this departure possesses no advantage and has already caused much confusion. No attempt is here made to deny that certain portions of the nervous system participate in the concussion; although it is self-evident that the functional disturbance and pathological lesions are primarily developed in connection with the *circulatory system.* These preliminary comments are made in preference to any attempt at the mere enumeration of symptoms, which, in order to possess real value, must be fully stated and explained. It should likewise be remembered that there are different degrees of concussion and these differences are indicated by a corresponding difference in symptoms.

It must now be apparent that the limits of this article compel me to economize space, so far as it can be done without defeating the object for which it was written. Permit me, therefore, once more to call attention to the fact that concussion always produces either excitation or depression, *i. e.*, functional activity or repose. The former condition possesses practically little interest, if observed immediately after the application of the concussive force, since it is commonly of short duration, and does not require any attempt at treatment. However, there is another form of excitation occasionally observed in severe cases of concussion of the brain which commonly makes its appearance from twelve to forty-eight hours after the receipt of the injury. This condition is indicated by a full pulse, flushed face, throbbing of the carotids, headache, hot and dry skin, photophobia, noises in the ears, and sometimes marked drowsiness. These symptoms point to the existence of cerebral hyperæmia, which is commonly of short duration; but in some cases it is the prelude to inflammation of the brain. In the severe cases of concussion of the brain or spinal cord the prompt appearance of *symptoms indicative of depression* commonly suggests the existence of organic lesions, rather than mere functional disturbances; while, as a general rule, the degree of danger is fairly expressed by the depression. It should, however, be remembered that the symptoms of depression, in order to possess any special value, must pertain especially to the functions which are known to be performed by these organs. Therefore, a diminished consciousness, although the patient may be aroused sufficiently to answer questions, the pupils contracted or dilated, relaxation of the sphincters, a feeble and irregular pulse, shallow and sighing respirations, a cold, pale, and clammy skin, are symptoms that point very clearly to the brain as the seat of the injury when the symptoms have followed promptly after the application of concussive force. The symptoms following those above recorded belong to the reactionary period; the object of this paper does not require their mention here. Concussion of the spinal cord is most commonly indicated by the appearance of paralytic symptoms, which frequently involve the lower extremities, especially the motor power and likewise in many cases also the sensory. Therefore in our experiments made on dogs our attention was promptly directed to the movements of these animals immediately after the application of the concussive force.

The following facts possess an important bearing on the subject now under consideration. From a recent summary made from my "Experimental Study of Lesions arising from Severe Concussion" I shall here venture to cite the following: "Paraplegia is a very important indication of a lesion of the spinal cord and may have its origin either in a disease or traumatism. This morbid condition may be either complete or incomplete, and when due to

disease it is commonly slowly progressive; but if due to traumatism it is rapidly manifested and soon reaches its fullest development. In support of this statement examine the following facts: The whole number of cases in which pathological changes were found in the cerebro-spinal axis was fifty; the whole number of cases in which any indications of these lesions were observed during the life of these animals was thirty-three, while our record shows that in the last-mentioned class there were twenty-three cases of paraplegia."

It will here be observed that there were ten cases in which there had been noted during the lifetime of these animals some indication of traumatism, but which did not exhibit during that period paraplegic symptoms. It is also worthy of notice that in every instance these paraplegic symptoms were observed immediately after the application of the concussive force; and, furthermore, that in all cases of complete paraplegia there was not a single case which subsequently improved. In the large majority of cases of incomplete paraplegia there was commonly some improvement observed during the first three days, but in a few instances the paraplegic symptoms became more marked during the first twenty-four hours; however, even these cases soon showed signs of improvement. It is not claimed that even the immediate appearance of paralytic symptoms after the application of concussive force establishes, in all cases, the existence of pathological lesions in the spinal cord. I am strongly impressed with the idea that an injury of the peripheral nerves may be followed by temporary, and commonly, local paralysis. A certain degree of importance should be attached to the existence of either anæsthesia or hyperæsthesia in all cases where lesions of the spinal cord are suspected. The existence or absence of pain in these cases possesses very little interest for the diagnostician. In fact, the existence of pain and soreness ought probably to be looked on as having their origin in a contusion, sprain, or wrench, involving the vertebral ligaments, muscles, etc., rather than indicating lesions of the cord. Having now presented a few of the characteristic symptoms of true concussion of the brain, and likewise of the spinal cord, I desire in this connection to add that it is certainly very unfortunate for the science of surgery that it has hitherto been the custom of nearly all authors, writing on what they have unfortunately designated *concussion*, to group together half a dozen or more traumatic conditions, differing radically from each other in their *etiology*, *semeiology*, and *pathology*. It requires no prophet to assert positively that so long as this grouping is continued there will be a want of clearness in all these articles; that theory will be frequently introduced in the place of scientific facts; that clinical observation will continue to mislead the profession; that good-natured authors, believing that all their predecessors in writing on this subject have told a little truth, will still further add to the existing confusion in their attempts at compounding these incompatible ideas. Let me ask what would be the inevitable result, if medical authors should group together under the unfortunate cognomen of "Smith's disease," scarlatina, diphtheria, rubeola, roseola, variola, typhus fever, etc.? But this combination is no more objectionable than that grouped under the name of "railway spine," which is so frequently employed by so many of our surgical authors even at the present time. However, the dawn of a new light may be approaching, since Dr. John A. Lidell, in writing on "Injuries of the Back, including those of the Spinal Column, Spinal Membranes, and the Spinal Cord," states that "The traumatic lesions of the back naturally arrange themselves in three groups, as follows:

"1. Injuries of the integuments and muscles, or soft parts generally.

"2. Injuries of the vertebral column.

"3. Injuries of the spinal membranes, spinal cord, and spinal nerves."[1]

It must be apparent that this classification presents many important advantages over that commonly employed. Another serious source of confusion has arisen from the fact that the term concussion was, in former times, restricted in its application to the brain, although analogous pathological lesions were produced by the same force in nearly all the organs of the body.

Furthermore, concussion was badly defined by the old authors; because the term was used to indicate a condition induced by a more or less violent shaking of the brain, whereby serious symptoms were produced without lesions of the structures. Recent experiments on animals and a careful study of this subject have entirely failed to support their statements in regard to the non-existence of lesions after concussive accidents in the brain and spinal cord. The results of my experiments were very conclusive in regard to the existence of these lesions. There were fifty cases in which pathological changes were observed in the cerebro-spinal axis, but only thirty-three of these cases showed any symptoms of injury of this centre during life; it will, therefore, be readily seen that in seventeen cases, although pathological lesions existed, they were not made apparent by symptoms which could be recognized in the animals. It is also noteworthy that there was not a single case in which the existence of concussion of the cerebro-spinal axis was even suspected,

[1] The International Encyclopædia of Surgery, vol. iv. p. 668. Edited by John Ashhurst, Jr., M.D. New York: Wm. Wood & Co., 1884.

wherein by our subsequent examination, we failed to discover pathological lesions, *post-mortem* or *microscopical.* These pathological lesions in true concussions are certainly unique in character and nearly or quite pathognomonic in significance. The only lesions that bear semblance to the pathological changes of concussion are those arising from contusions, and these are localized and not distributed generally throughout the organ, as is commonly the case in the former morbid condition. However, there is found an exception to these rules in the case of concussion following gunshot wounds, in which the injury is commonly localized and more or less closely resembles the ecchymotic appearance arising from contusions. The functional disturbances and the pathological lesions are clearly shown in my experiments to have had their origin in the vasomotor system. In order to illustrate the pathological changes in the spinal cord which have been observed to follow in a mixed or complicated case of concussion of this organ, I will here cite the report of an autopsy, etc.,[1] made on the body of a coal-porter, who had died thirty-four hours after the accident:

"*Autopsy*: There was no external trace of injury. The membranes of the cord were healthy. The substance of the cord was contused opposite the fourth and fifth cervical vertebræ. On section there was found ecchymosis of the posterior horns of gray matter on the left side, and of the adjacent part of the lateral and posterior columns. There were also limited spots of ecchymosis on the right side, one in the right posterior column and one in the right anterior horn of gray matter. The gray substance, generally, was hyperæmic. On removing the spinal cord and membranes nothing abnormal was discovered in the vertebræ until the posterior ligament had been dissected off, when it was seen that the body of the fourth was separated from that of the fifth, and the left articular process of the fourth had been chipped off."

Dr. John A. Lidell, who reports this autopsy, comments on it as follows: "The essential features of this instructive case are as follows: (1) The cord substance was injured by concussion and not by any displacement of the parts. (2) The injury was attended by a number of minute extravasations of blood (ecchymoses) in the gray substance. (3) There were anæsthesia and loss of motion in both lower extremities and in the left arm. (4) There was paralysis of the sphincter ani and sphincter vesicæ, which denoted that the reflex motor apparatus was also paralyzed. (5) The anæsthesia passed away in the course of some hours, the return of sensibility being noted first in the parts most distant from the injury. (6) Hyperæsthesia appeared synchronously with the reaction from 'shock,' and steadily increased in severity. (7) Hyperæmia of the gray substance was found as well as ecchymosis. It should be remarked that the hyperæsthesia was more severe in the right arm than elsewhere, and this part had not at any time been paralyzed." This case was reported by Dr. Lidell as a pure or uncomplicated one of spinal concussion, but I am compelled to question the correctness of the report in this particular, and direct attention to the ruptured ligament which it seems to me may have permitted a partial dislocation to have taken place, with contusion of the cord, the vertebræ afterward having been restored to their proper position by the natural resilience of the parts. The symptoms of paralysis were certainly more marked than they are usually in cases of pure, uncomplicated concussion of the spinal cord. The following microscopical report conveys a very clear idea of the pathological lesions observed in our experiments on animals in the cerebro-spinal axis when there were no complications in this centre:[1] "Brain intensely hyperæmic, otherwise normal. Every portion of the cord intensely hyperæmic. There were punctate hæmorrhages in the dorsal and cervical regions of the spinal cord, in both the anterior and posterior horns, also in the middle commissure."

The striking analogy existing between the lesions in cases of death caused by electricity and the other cases of concussion may be probably better illustrated by citing the report of the autopsy made by Dr. Carlos F. McDonald on the body of William Kemmler after execution by electricity, since this examination has been more carefully detailed than any of the others. The others, however, entirely agree with McDonald's, so far as given. McDonald's report is as follows: "Rigor mortis marked. On incising the skin over the sternum the blood which escaped was unusually dark and fluid and remained so on exposure. Lungs: Tardieu spots were noticed on the posterior border of the lower lobe of the left lung, also in the middle lobe of the right lung. Heart: Valves and substance normal, ventricles empty. Liver: Blood from cut surface of dark-crimson hue. Gall Bladder: Distended with bile. Spleen: Normal. Kidneys: Both markedly congested. Brain: *Capillary hæmorrhages* were noted in the floor of the fourth ventricle, also in the third ventricle, and in the anterior portion of the lateral ventricle. The perivascular spaces seemed to be distended with serum and blood." Dr. Spitzka's report of the preliminary microscopical examination is as follows: "The brain,

[1] International Encyclopædia of Surgery, vol. iv. p. 790 et seq. Edited by John Ashhurst, Jr., M.D. New York: Wm. Wood & Co., 1884.

[1] An Experimental Study of Lesions arising from Severe Concussion, p. 22 et seq. By B. A. Watson, M.D. Philadelphia: P. Blakiston, Son & Co., 1890.

spinal cord, and peripheral nerves appeared strictly healthy in every part examined, except in the area corresponding to the discolored (anæmic through the contraction of the vascular channels) area of the Rolandic and pre-Rolandic regions, the ventricular surface, the pons and the medulla oblongata. The latter, which had been the seat of post-mortem preservation of temperature approaching that of the normal human body, were distinctly softer than the observer has ever been accustomed to find these parts in autopsies on persons of Kemmler's age, so soon after death. The hæmorrhagic spots in the fourth ventricle, which were strongly marked, were not accompanied by signs of parenchymatous rupture of large bloodvessels. Hence they may be regarded as having the same significance as the 'taches de Tardieu' found on the surfaces of the organs, notably the heart and lungs. The peculiar softened vesicular zone of tissue underlying the outermost layer of the cerebral cortex is noteworthy as 'the destruction line,' and runs parallel to the free surface of the brain without dipping with the sulci. Examination of the fresh specimen revealed the existence of vacuoles (probably gas bubbles) in the ganglion cells and in the parenchyma of the destruction line. From the fact that no hæmorrhages had occurred in this softened area, it is a just inference that it was produced after life had become entirely extinct, for the continuance of a blood circulation in a softened brain area is incompatible with the bloodless appearance already noted, and the absence of capillary hæmorrhages in this very district, while they were present in those remote from the site of the electrode."

In order to approach the consideration of *malingering* it is necessary to devote some attention to the traumatic conditions which frequently complicate concussion in the cerebro-spinal axis; since the majority of authors still include these morbid conditions under the head of "spinal concussion," "railway spine," etc. Fractures and dislocations of the vertebræ require little attention at the present time, since they are generally easily diagnosticated, the only exception to this rule being those cases where there is a complete absence of deformity, which may be the case where the fracture consists in chipping off a portion of the articular vertebral surface, etc., or in an incomplete dislocation of a vertebra in which the natural resiliency of the ligaments and muscles has restored the symmetry of the parts. In these cases, it is thought that the careful and observing surgeon will not be compelled to remain long in doubt as to whether the patient before him is a malingerer or suffering from a real traumatic injury—since the prompt appearance of objective symptoms will certainly be largely dependent on the locality of the injury, while their degree of severity will depend very much upon the extent and character of the traumatism.

There now remain for our consideration in this connection contusions, sprains, twists and wrenches of the back, which on account of their medico-legal bearings are entitled to a more thorough analysis than can be given them in this article. The study of these morbid conditions will be greatly simplified by bearing in mind that their symptoms, the primary and secondary effects, are entirely analogous to injuries of the same character in other parts of the body. It is claimed that the spinal column and the bones which connect directly with it are provided with ninety-nine articulations. The symptoms which characterize the morbid conditions now under consideration are pain, swelling, tenderness under pressure, and occasional ecchymoses. The existence of the symptoms will be limited to the area involved in the traumatism, while the degree of severity will depend on the intensity of the injuries. In some cases there may be constitutional disturbances which will aid in establishing the existence of a morbid condition. The ecchymoses and swelling are objective symptoms, and consequently entitled to due consideration, while the pain, stiffness, and tenderness under pressure may require confirmation. The verification of the patient's statements on these points, and frequently on others, especially questions involving the existence of paralysis, might be definitely put at rest by the proper use of an anæsthetic, which ought to be frequently employed in medico-legal cases. The general surgeon no longer hesitates to employ this agent in his private and public practice for diagnostic purposes; and why should it not be thus employed for the purpose of securing justice in our courts?

Drunkenness and syncope may make the diagnosis more difficult in certain cases of concussive accidents, whether it be pure or complicated concussion; but these factors are of short duration, and therefore cannot long continue to embarrass the surgeon.

It is unfortunately too frequently the case that a surgeon commences his examination in medico-legal contests after *having fully formed an opinion*, or at least a bias or prejudice. In many cases, in fact almost universally, this arises from the want of an analytical mind and of any carefully arranged system of examination. These are very serious defects in the expert witness, and when fully demonstrated should disqualify him from testifying. There is another serious defect frequently observed in the members of our profession, which sometimes has its origin in laziness, although occasionally in an inordinate greed, where the physician has been accustomed all his life to give an opinion to a patient without either

an examination or thought. It will be perceived that I have not yet reached the case of the malingerer; but I have thus far merely paid my respects to those who aid and assist the malingerer. The malingerer is certainly entitled to a careful and thorough examination, and each surgeon employed in the case ought to proceed in his examination with the same degree of care and caution that the most conscientious chemist would exercise when required to make a chemical analysis in the interest of justice. It therefore becomes highly important to learn the true history of the litigant, and likewise that of his father, mother, brothers, and sisters. All these matters have a special bearing on the case. It will be readily admitted that any person who has established a good character for truthfulness and honesty ought not to be classed with a mere adventurer. In the examination of all the factors involved in these cases of so-called "railway spine" the fact should never be lost sight of that *correct scientific opinions can only be reached by a systematic, methodical, and painstaking investigation.*

Let us here present a brief *résumé* of some of the points which have been more or less considered in this paper:

1. As used by those who first employed it, the term concussion was erroneously defined, and in its application, unfortunately restricted to the brain. These errors had their origin in a deficient knowledge of the pathological lesions engendered by concussive force.

2. Concussion is a more or less violent shaking or agitation of various organs in the body, producing functional derangements dependent on vasomotor changes and well-defined pathological lesions.

3. Concussion may be either general or special—general when several organs are involved at the same time, or special when the entire concussive force is expended on a single organ.

4. The symptoms arising from concussion will chiefly depend on the extent of the pathological lesions and the functions of the organs.

5. The frequency with which concussion will occur in any particular organ will depend on the point to which the concussive force is applied; the relative weight of the organ; the character of its texture; the protection afforded by its anatomical surroundings.

6. The fifth statement supplies the explanation of the comparatively frequent occurrence of concussion of the brain, lungs, liver, and kidneys, as compared with that of the spinal cord.

7. Concussion of the brain and spinal cord is always attended with immediate symptoms.

8. Concussion of the brain or spinal cord without immediate symptoms is a mere hypothesis, a myth, and has no real existence.

9. There is no pathognomonic symptom of concussion in any organ of the body, but a thorough, systematic, methodical examination by a skilled surgeon will secure a correct diagnosis.

Finally, I desire to reiterate the fifth conclusion, expressed by Dr. Henry Hollingsworth Smith in a paper which he read before the surgical section of the American Medical Association in 1889, and which is as follows: "No physician should go into court and swear that a plaintiff has had a concussion of the spinal cord, or of its nerves, unless he has proved the disturbance of the normal functions of the cord, as shown in sensation, or motion, or both, and that the symptoms appeared *soon* after the injury."

ORIGINAL LECTURES.

PLEURISY WITH EFFUSION—SIMPLE ENLARGEMENT OF THE THYROID GLAND.

BY JOSEPH M. PATTON, M.D.,
PROFESSOR OF INTERNAL MEDICINE IN THE CHICAGO POLYCLINIC, CHICAGO, ILL.

GENTLEMEN: I show you this afternoon this young man, who is fifteen years of age. He comes to us saying that about two or three weeks ago (he does not state the exact time, which is a point to be noted) he began to complain of some transient pains in the side, and that he felt languid and tired. A week or ten days since, he began to notice that there was some difference in the contour of the two sides of the chest, this difference being sufficiently marked to call his attention to the fact that there was something wrong with his chest, and to-day he comes for advice. We will examine him to see what we can find. The imperfect history is one point in this class of affections to which I desire to call your attention. His pulse is 100, and his temperature 101° F. You notice, as you look at the boy with chest stripped, that there is considerable difference between the two sides, the left being fuller and more prominent, especially in the mammary region, and not so flat as the other (right). This prominence in the mammary region on the left side is not important. In young people, before the cartilages have attained growth and firmness, some deformity in this region is often found as a result of pressure on the yielding cartilage, especially when there has been rhachitis; it is of no importance in this connection, so that we do not pay much attention to the prominence which you see in this case. You notice, also, that behind there is apparently some lateral curvature of the spine; the shoulder on the left side droops somewhat, and there is distinct bending of the spinal column. The reason for that you will see later on. There is an absence of pulsation in the cardiac region, but a marked pulsation to the right of the sternum, at about the third and fourth intercostal spaces; this is due to the displacement of the heart; hence there is an absence of pulsation in the natural cardiac area. This may be due to effusion into the pleural cavity; to extensive emphysema in one lung; to tumors in the mediastinum; or to extensive retraction of the lung, with pleuritic adhesions, so that the heart is displaced.

These causes are not factors in the displacement of this boy's heart. We must go farther to find the reason for it. So much for inspection. On palpation there is a loss of vocal fremitus on the left side, while the fremitus on the right side is exaggerated. The percussion note is flat on the left side, and a little more resonant on the right side. In regard to the percussion note being flat all the way up, you know your text-books tell you that in pleurisy with effusion you have flatness below the line of fluid, and above it you have resonance of a tympanitic quality, or increased resonance, which may be due to some compression of the upper lobe of the lung of that side, or to slight condensation. In cases with a moderate amount of effusion, the lung being pressed upward, you will get percussion resonance of a tympanitic quality if the upper lobe is not compressed; if the fluid nearly fills the pleural cavity, and the upper lobe is moderately compressed, the resonance is increased. In this case the left side is practically filled with fluid, so that the flatness is uniform up to the first rib. The vocal resonance is more or less distinct all over the left side, and the respiratory murmur can be heard all over the left side and at the angle of the left scapula distinctly, having a marked bronchial character. That is not in accord with the signs of palpation and percussion. The sounds we have elicited by palpation and percussion are those of pleurisy with effusion, yet we should not be able to get with pleurisy and effusion the vocal resonance or respiratory murmur. I want to call your attention to the fact that there are exceptions to all of these cases, and that you cannot go absolutely by the classical signs as laid down in your text-books. You will find cases of pleurisy with effusion in which you can get distinct vocal resonance below the level of the fluid, and you get distinct respiratory sounds. In those cases of pleurisy with effusion in which the chest is half full of fluid, as a rule you have the classical signs of pleurisy; you have absence of all signs below the level of the fluid. When the chest is almost or completely filled, and the lung is compressed against the spinal column and against the opposite side, you get a transmission of sound if the bronchi are still patent. Some of the books tell you that in some cases of pleurisy with effusion you get breathing of a bronchial character at the angle of the scapula. I want you to listen to see how distinct it is in this case. It is not vesicular in quality; it is bronchial in character, the same as is observed in croupous pneumonia, with the exception that it is further away. It is not quite so harsh, and it has the sensation of being produced at a greater distance, because of the indistinctness with which it is transmitted through the fluid. So that, taking the exceptions in this case into account, we would make a diagnosis of pleurisy with effusion, notwithstanding the fact that we get the sounds so plainly all over the left side of the chest. The scoliosis here, which is slight, is probably due to the weight of the fluid, and will probably disappear on removal of the pleural contents, as will also the displacement of the heart.

The most important point in the differential diagnosis of this affection pertains to croupous pneumonia. There are other diseases of the chest which will simulate it more or less, such, *e. g.*, as emphysema and those diseases of the chest which give you dilatation of the chest wall—chronic pleurisy, empyema, pneumothorax, etc. Any of these diseases will simulate pleurisy with effusion, from the fact that they will dilate one side of the chest. But the most important differential diagnosis is to be made between this disease and croupous pneumonia. Both may give loss of motion of the affected side of the chest; both give you compensation by the opposite lung; both are usually unilateral; both give you changes in the physical signs which may be very much alike. You get the dulness, with the exception that in croupous pneumonia the dulness is not so complete, and it does not approach the complete flatness that you may get in pleurisy with effusion. The vocal fremitus in croupous pneumonia is increased instead of diminished or absent. The voice-sounds in croupous pneumonia are increased; you get bronchial breathing and increased vocal fremitus. You get bronchial breathing on this (left) side at certain points, so that, although the classical signs of the two diseases are entirely different, the diagnosis is not so easy when you get a case of this kind, in which you have bronchial breathing at certain points in the lung; you have to be careful to distinguish it from pneumonic consolidation of the entire lung. Though the physical signs of the two diseases may be at times very similar, other symptoms are the more sudden onset in pneumonia; the character of the pain; the character of the dyspnœa; the temperature range; character of the sputa—rusty and sticky in pneumonia, frothy and white in pleurisy, etc. In differentiating this disease from emphysema, you can do so by the character of the respiration and the tympanitic character of the percussion sound in emphysema. There is not much likelihood of confusing emphysema and pleurisy with effusion, for the reason that the former is more or less two-sided. It occurs at times on one side only. It may be confusing from chronic pleurisy or empyema. You are to make the diagnosis a good deal by the history. Chronic pleurisy will, at times, give you the same signs as are present in this case, but, as a rule, you have fever and sweats, and much exhaustion, although it may be so confusing that the diagnosis is only to be made by withdrawing some of the fluid. Again, you cannot always tell with absolute certainty that the fluid in the chest is serous or (more or less) purulent. The differentiation from pneumothorax is to be made by the rapid dyspnœa which occurs. There is perforation of the pleural tissue, the result of destruction of lung tissue in tuberculosis; there is a sudden rupture into the pleural space, causing intense dyspnœa, coming on rapidly, and being persistent. This may also occur from gangrene, pneumonia, or, as in a case reported, by the bursting of a distended air-vesicle or dilated bronchial tube. Of course, after this has occurred, the physical signs will differ; you get dulness in the lower part of the chest cavity, where there is fluid, and tympanitic resonance above the fluid; you get the cavernous breathing of a metallic character at the point where the opening in the pleural membrane has taken place. If the opening is closed you may not get respiration of a metallic or cavernous character. You may get the sound or metallic tinkling, both of which are characteristic.

One peculiar feature about this case is the degree of displacement of the heart and the comparatively little dis-

tention of the intercostal spaces of the left side. The intercostal spaces, as you see, are not at all bulging. Bulging is laid down in the text-books as one of the prominent symptoms when there is a quantity of fluid present. You must take into consideration the size of the chest wall, its thickness, the resistance of the hard and soft parts, the character of the organs contained within the chest, the degree of development they have attained, and the likelihood of adhesions of various kinds which may limit their displacement. When a young boy has an even chest cavity, is perfectly healthy, there are likely to be no adhesions of the pericardium or pleural membrane to prevent displacement. When there are no tumors present in the chest, when the chest wall is elastic, you can readily see that the pressure may be felt more by the organs in the chest cavity than by the chest wall; therefore there is considerable displacement of the heart without very much distention of the intercostal spaces. We find the heart over on the right side of the sternum, and the lung is markedly compressed against the opposite side, sufficiently so to cause distinct bronchial breathing through considerable fluid.

It has been pointed out as important in distinguishing the character of the fluid contained in the chest, that in fluids containing pus you get little or no transmission of voice-sounds, although the fluid may be thin, but that in the case of serous fluids you are apt to get the transmission of sounds as you do in this case. That, of course, you would expect from the nature of the fluid —a heavier fluid moves with greater difficulty, and therefore the sounds are not so easily transmitted. It is sometimes difficult to determine whether these collections of fluid are unilocular or multilocular. You may have divisions of the pleural cavity into two or more compartments, and for that reason you may have localized collections of fluid. It has been pointed out that the zone extending around the side of the chest, about the level of the sixth intercostal space from the mammary region to near the spine, in which you obtain more marked vocal sounds than you do in any other portion of the chest, indicates that there are pleuritic bands which convey sounds to the chest wall. This can hardly be depended upon as a diagnostic sign, but it might be of use.

Now, as regards the treatment of this class of cases. It depends upon the stage in which you see the patient. It is good practice to occupy two or three weeks in trying to remove the effusions before you resort to surgical interference, provided the effusion is not great enough to compromise the patient's lungs by pressure in that short space of time. Such treatment will consist mostly in the use of diuretics, acetate and citrate of potash, and the administration of iodide of potash, citrate of caffein, digitalis, Fowler's solution of arsenic, if there is anæmia, and iron. In these cases you get little or no kidney action until you improve the general nutrition by the administration of iron. After some little time with the use of this treatment, if the fluid does not disappear it is proper to resort to surgical interference. In those cases in which, as in this one, there is marked compression of the lung, it is well to remove a certain amount of fluid in order to make room for expansion of the lung, and room for absorption by the pleural vessels. Take a chest cavity distended like this; the pleural vessels have all sustained a good deal of lateral pressure, and after removing a small quantity of fluid from one of these cavities the rest of the fluid will disappear rapidly, because it removes the pressure on the vessels and permits of their taking up the fluid, thus allowing expansion of the lung.

In cases in which the diagnosis is not so clear as in a typical case, there can be no harm by the introduction of a hypodermatic needle in order to determine the presence of fluid. The danger of the introduction from an aseptic hypodermic needle is practically nothing. I have for a long time practised the introduction of the needle in order to determine principally the character of the fluid. Even in a case like this, in which we are not in doubt as to the diagnosis, it is well to introduce it in order to determine if the fluid is flaky, and if it will run through a small needle. I have never seen any bad results from the introduction of the needle or from aspiration when the instruments were clean. I once had an inexperienced assistant reverse the action of the pump, and pump quite a quantity of air into the chest of a man seventy years of age, without any bad result. (Professor Patton then introduced the needle of an aspirator and withdrew about three quarts of serum.)

Here is the Le Noel pump, a very complete instrument, the needle of which, you see, has a blunt sliding point, arranged so as to cover the sharp end of the needle after it has entered the pleural cavity, and thus prevent injury to the lung. In this instance there is no danger of injury if the needle is properly handled and we will use the ordinary aspirator.

SIMPLE ENLARGEMENT OF THE THYROID GLAND.

The young lady I now present to you has been under treatment at the clinic here for some time. The case is one of those you frequently see, the diagnosis of which may be troublesome. She has an enlargement of the thyroid gland, a bilateral enlargement involving the isthmus, with a good deal of protrusion of the neck, which annoys her considerably, and she is unable to cover it. The gland is soft, does not exhibit any murmur, and is uniform in its enlargement. Now, the interesting point in this case is whether the diagnosis should be simple enlargement, cystic enlargement, hypertrophy of the gland, or whether it is exophthalmic goitre, which, of course, makes a great deal of difference in regard to both the treatment and prognosis. The differential diagnosis between simple hypertrophy of the thyroid gland and exophthalmic goitre is not the easiest thing in the world. Enlargement of the gland is one of the three classical symptoms of Graves' disease, and it is, as a rule, preceded by cardiac symptoms. The term cardio-vasomotor disease, which was applied by Simpson to exophthalmic goitre, is a much better term, because it expresses not only the pathological relations so far as we know them, but it expresses the clinical elements which present themselves. As a rule, the cardiac symptoms are the first to appear. There is palpitation of the heart, either constant or spasmodic, with a good deal of pulsation in the arteries, followed by some cerebral symptoms which accompany the change in the vascular tension—that is, giddiness, dizziness, and at times a tendency to syncope. As a rule, I say, these symptoms present themselves before the enlargement of

the gland. The enlargement of the gland may appear simultaneously with ocular protrusion, or may precede it, or may follow it; but in some cases the enlargement of the gland comes first, and it is difficult to tell whether you have a case of exophthalmic goitre or one of simple enlargement of the thyroid gland. You must remember that in young girls it is a very common thing to have simple enlargement of the thyroid gland with rapid action of the heart—that is, there is a tendency of the heart to run up to 120 or more, because the vascular tension is low, and there is a lack of innervation of the vascular system. Such patients are anæmic; their appetite is not good; the mucous membrane presents the appearance of chlorosis, only it is not so well marked. It is a frequent thing for girls in this condition to have enlargement of the thyroid gland, which, preceded by cardiac manifestations, may very readily be mistaken for exophthalmic goitre; but you will hear no murmur in the gland, and it will not be followed by ocular symptoms. In the case of this young girl the diagnosis of simple enlargement of the thyroid gland was made, and she was put on tonic and alterative treatment, and the result so far has been satisfactory. From quite a marked enlargement, the gland has become smaller and smaller. She has been under treatment some five or six months, until now there is simply a little broadening of the throat; and I think the cardiac symptoms have mostly disappeared. If you listen over the aortic area, there is little intensification of the second sound of the heart; it is a little more marked than it should be, showing that the heart and vessels have not quite regained their proper condition.

The treatment she has been under has been iron, iodide of potassium, and biniodide of mercury. The form of iron given in this case was the same as you give in chlorosis—Blaud's pills. In those cases which present vascular symptoms—and this is virtually a vascular disease—we give nux vomica to increase the innervation of the vasomotor system. The iodide of potassium she has been taking in ten- or twelve-grain doses, three times a day, with the biniodide of mercury externally. In using this ointment there is no advantage in employing a strength so great as to cause irritation of the skin. It should be used strong enough to be absorbed without blistering the skin. It will, perhaps, cause a little irritation, redness, or soreness, but it should not blister. The strength to be used would be about half and half, the biniodide ointment of the strength of the Pharmacopœia, with any of the excipients, such as vaseline, cosmoline, lanolin, or any of the bland ointments. She has been using half vaseline and half of the biniodide, which produces just enough redness of the skin so as not to be sore, and yet have plenty of it absorbed. She is doing nicely.

Some time ago I saw a young lady, about twenty years of age, who was troubled with thyroid enlargement accompanied by cardiac palpitation. Owing to the fact that another member of the family had died of exophthalmic goitre, her physician had made up his mind that her case was also one of the same kind. After careful examination of the gland, the circulatory organs, etc., I came to the conclusion that it was a simple enlargement of the gland from loss of innervation of the vessels, loss of tone, and anæmia, and under the same treatment that this patient has been under she recovered completely. There is now no enlargement of the gland, no palpitation of the heart, and she is in good health. These cases are interesting to me on account of the frequency with which we see them, the difficulty sometimes in making a diagnosis, and the necessity of making a diagnosis in order that you may promise relief by your treatment. Intra-parenchymatous injections of iodine, carbolic acid, etc., will sometimes be of benefit in thyroid enlargement, though some cases of hypertrophy of the gland do not seem to do well under such treatment. Electricity is also very valuable in some rapid enlargements of the gland, but the results are not always permanent. Finally, there are some cases of long-standing enlargement of the gland which can only be remedied by surgical procedures.

MEDICAL PROGRESS.

Excision of an Aneurism.—KIMURA (*Sei I. Kwai. j.* December 27, 1890) reports a case of popliteal aneurism in which excision was successfully performed. After the preliminary incisions the popliteal nerve was held aside and ligatures applied to the popliteal artery above the aneurismal sac, and to the anterior and posterior tibial arteries, below, and the sac dissected out. The operation occupied an hour. The cure was complete.—*Revue Internationale*, April 25, 1891.

A New Method of Treating Ununited Fractures of the Patella.—WOLFF (*Deutsche medicin. Wochenschr.*, May 14, 1891) approximated the fragments of a fractured patella, which had failed to unite, by means of four double-pointed nails bent in the shape of horseshoes, in the broad portion of each of which were two holes. Four openings were bored into each fragment of bone and into them the nails were introduced and made fast. Approximation was accomplished by means of silver sutures passed through the holes in the nails. Slight loosening of the nails necessitated a secondary operation, five weeks after which the nails were permanently removed. Though the union of the fragments was not osseous, the result was eminently satisfactory, there being no separation of the fragments and function being admirably restored.

Antiseptic Dentifrice.—DUJARDIN-BEAUMETZ:

℞.—Acidi carbolici	. . . .	gr. ss.
Acidi borici	. . . .	gr. x.
Thymol	. . . .	gr. ¼.
Spts. menthæ piper.	. . .	♏j.
Tinct. anisi	. . . .	♏v.
Aquæ	. . . . .	ƒʒij.

Sig.—Rinse the mouth and brush the teeth after each meal.—*L'Union Méd.*, May 9, 1891.

For Pulmonary Tuberculosis.—POTAIN:

℞.—Sodii chloridi	. . . .	gr. xlviij.
Sodii bromidi	. . . .	gr. xxiv.
Potassii iodidi	. . . .	gr. v.
Aquæ destillatæ	. . . .	ƒʒj.

Sig.—A teaspoonful every morning in a glass of milk.—*L'Union Méd.*, May 7, 1891.

Treatment of Chronic Articular Rheumatism.—During subacute exacerbations antipyrin or sodium salicylate should be administered in small doses, long continued. In the intervals, arsenic in doses of from one-twenty-fourth grain to one-eighteenth of a grain, and from five to ten grains of iodide of sodium, at meal time, or from ten to fifteen drops of tincture of iodine daily, may be given. POTAIN recommends warm baths, preferring pool-baths to tub-baths, of one or two hours' duration. With this should be combined tepid douches of sulphurous water to the diseased articulation. Galvanization with the continuous current is preferable to faradization. The latter acts rather upon the muscles, the former upon the nutrition. The action of the iodide is favored by administration in an alkaline mineral water. If tincture of iodine is used it should be largely diluted. The degree of tolerance can be increased by the conjoint administration of a preparation of opium, such as paregoric.—*Revue Gén. de Clin. et de Thérap.*, April 29, 1891.

Intra-laryngeal Thyroid Glandular Tumor.—PALTAUF (*Wiener med. Presse*, May 10, 1891) reported to the Society of Physicians of Vienna the case of a girl, twenty-one years old, admitted to Albert's clinic with extreme dyspnœa. After tracheotomy had been performed, a tumor was discovered below the right vocal band. Suppuration subsequently set in in the left lobe of the thyroid gland, followed by septicæmia and death. At the autopsy, among other things, below the right vocal band was found a tumor as large as a bean, acinous in appearance, seated upon a ring of cartilage and constituted of the normal tissue of the thyroid gland. On the hyoid bone was a supra-hyoid gland, a portion of which was contained within the bone. The growths were not considered to be accessory thyroid glands but normal thyroid tissues which had gained entrance by proliferation into the larynx through the intervening structures.

The Diagnosis of Pulmonary Cavities.—SCHULTZE (*Centralbl. für klin. Medicin*, May 9, 1891) quotes Weil: "The certain recognition of pulmonary cavities is one of the most difficult problems in physical diagnosis." There are few symptoms indicative of the existence of large cavities. Such a condition is to be suspected when "changes of position give rise to alternating dulness and tympany on percussion." That this symptom may prove deceptive and may result from the existence of a system of small cavities is illustrated by the case reported. A shoemaker, forty-eight years old, suffered from progressively increasing cough, expectoration, shortness of breath and loss of flesh. There was evening fever and the ends of the fingers were clubbed. The lungs were emphysematous, the sputum abundant and fœtid, containing elastic fibres. Râles were heard at all parts of the chest and loud, bronchial breathing at the lower part of the left lung. In the sixth intercostal space on the left, there was dulness on percussion, when the patient sat upright, which disappeared when the recumbent posture was resumed. A diagnosis of pulmonary gangrene, with a large cavity, was made. Operative interference was contemplated, but Trendelenburg suggested the existence of a number of small cavities. The patient rapidly failed and died. The administration of myrtol failed to overcome the offensive odor of the sputum. The autopsy disclosed the existence of extensive bronchiectasis in both lower lobes, with loss of pulmonary structure in places.

The Fermentations of Milk and their Prevention.—PROFESSOR H. W. CONN, in a lecture before the Connecticut State Board of Agriculture, thus summarizes his conclusions as regards this subject:

1. The fermentations of milk are varied, although only a few are commonly recognized, because the souring of milk usually obscures all other fermentations.

2. All of the fermentations, except that of rennet, are caused by microörganisms getting into the milk after milking and growing there.

3. The microörganisms are so abundant around the barn and dairy that they cannot be kept out of the milk by any degree of care.

4. The bacteria which produce the abnormal or unusual fermentations, like slimy milk, bitter milk, etc., are, however, not so common but that they may be prevented from entering the milk in sufficient quantities to produce serious trouble.

5. Filth is ordinarily their source, and cleanliness the means of avoiding them.

6. The souring of milk cannot be prevented even by the greatest cleanliness.

7. Salicylic acid in proportions of 1 : 1000 may be of some little value in delaying the souring, but its use is not to be recommended except in special cases.

8. Milk can be entirely deprived of bacteria by the exposure to a temperature of from fifteen to twenty degrees above that of boiling water, or by a long-continued boiling, or by a series of short boilings on successive days.

9. Such milk has the taste of boiled milk. This taste appears at about the temperature of 160° F. Hence has arisen the method of Pasteurization of milk. By this method it is heated to a temperature of 155° F. for a short time, and then cooled. This greatly delays the fermentations, and also kills the pathogenic germs that may be present.

10. In our large cities the popularity of sterilized milk is rapidly increasing, especially given to patients troubled with diseases of the digestive organs.

11. The cooling of milk immediately after it is drawn from the cow is of the greatest assistance in delaying the fermentation, and in the present state of our knowledge is probably the most practical method which can be recommended.—*Science*, May 15, 1891.

For Gonorrhœa —

℞.—Creasoti . . . . 10 drops.
Extract hamamelis fl. } of each 15 "
Extract hydrastis fl. }
Aquæ rosæ . . . . 2 fl. ounces.
Aquæ . . . . . 6 " " —M.

Sig.—Use as an injection.

—*Journ. de Méd., de Chir. et de Pharmacol.*, April 20, 1891.

THE MEDICAL NEWS.

A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

COMMUNICATIONS are invited from all parts of the world. Original articles contributed exclusively to THE MEDICAL NEWS will upon publication be liberally paid for, or 250 reprints will be furnished instead of payment. When necessary to elucidate the text, illustrations will be provided without cost to the author.

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SATURDAY, JUNE 6, 1891.

AN INTRODUCTORY WORD.

THE incoming editor considers the duty of his journal to be that which, in large, is the duty of medicine itself—the furtherance of practical therapeutics. But a significant qualification at once arises—practical therapeutics must, at this time, be scientific therapeutics.

The worker in any abstract science does not think of practical ends, but pursues truth alone. And this is a noble ideal. But the family physician must often, and indeed generally, fix his attention almost solely upon the very practical details of the cure of concrete disease—an equally high and worthy aim. In the differentiation of function brought about by modern social conditions and progress, these two classes of workers are very prone to become too sharply contrasted, each pursuing its single way, forgetful of the other. Medical journals are bountifully present, the aims of which seem to be to furnish prescriptions for memorizing or copying, to satisfy childish or prurient curiosities, or to supply medical rules of thumb that should have been taught by common sense or learned during the first year of college study. This field having been so excellently occupied, we shall not attempt competition.

On the other hand, laboratories and periodicals devoted to pure scientific research, physiological, bacteriological, or pathological, have been everywhere multiplied, extended, and delimited until the humble practitioner of medicine almost despairs of keeping in touch with such amazing specialization and development.

It is the glory of medical science that in aim and strain it is at once genuinely scientific and intensely practical; and it is believed that the great majority of physicians in their work earnestly desire this union of science and utility.

Now it is precisely to this majority and with this purpose that THE MEDICAL NEWS would minister. It would keep in view this duty of becoming yet more adequately the medium for the dissemination of a scientific but at the same time a thoroughly practical prophylaxis and cure of disease. It is incontrovertible that true medicine is conditioned upon an accurate knowledge of pathogeny and pathology, but it is also beyond contradiction that the final end of all medical work is either to prevent or heal disease. The abstractly true or scientific must and will somehow become practical or useful, and the concrete or practical must always be the object of scientific study.

Our aim will, therefore, be to serve as the intermediary for bringing to the busy practical worker the useful results of original medical research, and the concrete lessons of many single rich experiences. In this work we confidently look for the sympathy and help of contributors and subscribers.

A brilliant and striking illustration and realization of such an ideal as we have described very appositely occurs in the present issue of THE NEWS: When, from the examination of a drop of blood taken from a patient's finger, hitherto unsuspected disease may be diagnosticated, and either a heroic treatment that saves life instituted, or a speedily realized fatal prognosis announced—our faith in our science at once rises, and our power over disease is vastly increased.

OBSTETRICAL AND EDITORIAL HOMOLOGIES.

IN his lecture before the American Academy of Medicine, PROFESSOR PARVIN most deftly hit off certain aspects of the work of the editor of a medical periodical. It is rare that great learning and experience, both scientific and literary, are so happily joined with a touch so light and accurate; one almost fails to see the seriousness behind the banter and the smile. *Inter alia* he said:

"No man should attempt the duties of a medical

editor unless he is a good obstetrician, especially as it relates to the diagnosis of pregnancy and the care of premature and feeble infants. Let me remind you that Socrates, in Plato's Theætetus, states that he is the son of Phanærete, a brave and burly midwife; that he practised midwifery; that he attended men and not women; that he practised on their souls when they were in labor; and, lastly, that his art had its triumph in thoroughly examining if the thought which the mind brought forth was a false idol or a true birth.

"Let me press the analogy a little further: The medical editor ought not only to differentiate between true and false pregnancy, but he should also be able to tell whether gestation has reached the normal term. Unfortunately, errors in diagnosis are very frequent. Pseudocyesis is not uncommon; tympanitic distention may be mistaken for pregnancy, and when the delivery takes place it is simply expulsion and explosion of gas. True brain-babies may be born, but they are too feeble to live unless carefully cared for in an incubator by the editor; an article, prematurely reporting a case alleged to be cured by an operation, may be kept by the editor until the cure is established; it may be written in execrable English, but the wise editor will put good clothes on the child before permitting it to appear in public. I am sure that we all meet every few weeks with papers appearing in reputable though probably not the best medical journals, to which the criticism just made can be justly applied.

"I am sorry to say that medical editors are sometimes ignorant of the characteristics of a child born at term; they fail to recognize the average weight such a child should have, the degree of development and activity it should manifest, and consequently present their readers with imperfect specimens of medical reproduction.

"It occasionally happens that a doctor without any reproductive power, or endeavoring to produce offspring every few weeks, when his pregnancy ought to last several months, is compelled to evolve from his inner consciousness, without any conception having occurred, that which passes for a baby with some, but is purely artificial. Laying aside metaphor, cases which never occurred are sometimes reported in medical journals; some keen and experienced eye will discover the sham, while many suspect that the story is pure fiction. May the day come when all medical editors will be wise enough and brave enough to exclude from their literary museums all artificial curiosities.

"The medical editor may be engaged in procuring abortion. Thus, there is a case of true pregnancy, but gestation has by no means reached its term; the editor with few contributors, and printers clamorous for copy, extorts from this pregnant doctor the promise of an article long before he can properly prepare it; it may be a fee, or friendship, or promise of influence, or something of like sort which is the abortifacient, but it does the work."

DA COSTA — BARTHOLOW.

IN unanimously electing DR. J. M. DA COSTA Emeritus Professor of Clinical Medicine and DR. ROBERTS BARTHOLOW Emeritus Professor of Materia Medica and Therapeutics, the Trustees of the Jefferson Medical College have paid a graceful tribute to the greatness of two distinguished teachers. Thousands will unite with us in hoping that, though withdrawn from their more active professorial duties, both may long continue to carry on their labors, each in the respective department of which he is a recognized representative, and to increase the number of their unexcelled contributions to medical literature and progress. Professor Da Costa will continue as heretofore to deliver his clinical lectures at the Jefferson College Hospital.

SOCIETY PROCEEDINGS.

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA.

Forty-first Annual Session, held at Reading, June 2, 3 4, and 5, 1891.

TUESDAY, JUNE 2D.—FIRST DAY.

THE Forty-first Annual Session of the Medical Society of the State of Pennsylvania, and the first session of the Association as an incorporated body, convened in the Academy of Music, Reading, on the morning of June 2d. It had been almost forty years since the organization last met in this city, and the delegates from the various County Medical Associations of the State received a cordial welcome from their fellow-physicians of the County of Berks.

The President of the Society, Dr. Alexander Craig, of Lancaster County, called the meeting to order at 10 o'clock. After addresses of welcome by the Mayor of the city, the Hon. T. P. Merritt, and the Chairman of the Committee of Arrangements, Dr. S. L. Kurtz, the remainder of the morning was devoted exclusively to the hearing of reports and the transaction of new and unfinished business.

On motion of the permanent secretary, Dr. William B.

Atkinson, of Philadelphia, Dr. Hiram Corson, of Montgomery County, who was president of the Association forty years ago, and Dr. S. P. Ziegler, of Cumberland County, a president of more recent date, were invited to the platform.

Dr. Charles W. Dulles, Chairman of the Committee on Incorporation, announced that a charter had been granted to the Association through a decree of the Court of Common Pleas, No. 4, County of Philadelphia, and that the first meeting of the Incorporators of the Society had been held in Philadelphia on March 25, 1891, Drs. John Curwen, W. T. Bishop, A. M. Miller, John B. Roberts and Charles W. Dulles being present. At this meeting trustees had been elected, and the officers selected at the last annual meeting of the Association had been indorsed. Dr. Dulles offered a resolution that the officers of the Medical Association of 1890–91 be requested to hand over to the Incorporators at the present meeting all papers and other articles connected with their various offices. Carried.

Dr. George B. Dunmire, of Philadelphia County, submitted the Treasurer's Report. The total receipts for the year had been $2907.52, and the expenditures $2097.64, leaving a cash balance in the treasury of $809.88.

Dr. W. Murray Weidman, of Berks County, moved that a committee of one from each County Medical Association be appointed by the President of the Society to take measures toward the adoption of some method of raising funds for the erection of the Rush Memorial Monument, as proposed by the American Medical Association. Dr. Atkinson moved that each county be requested to suggest to the President the most available man for this purpose. Dr. Craig appointed Dr. Weidman chairman of this committee, after which the motion was carried as amended.

At the afternoon session the Address in Medicine was delivered by Dr. J. CHRIS. LANGE, of Allegheny, his subject being "Some Considerations Regarding New Remedies and their Use by the Profession." He founded his remarks upon the aphorism that disease is to be treated by the destruction of its cause—that is, it is to be antidoted, just as poisoning by arsenic must be antidoted by the hydrated oxide of iron. He included under the caption "New Remedies" all preparations and products not officinal in the United States or other Pharmacopœias, and dwelt largely upon the question of proprietary medicines in their relation to medical ethics. He claimed that such drugs should only be used upon a clear indication founded upon experimental study, and he proceeded to show that in the vast majority of instances the drugs which have been foisted upon the profession and public at large as specifics in certain diseases, or to antagonize certain symptoms, have, after careful investigation, been proved to be lacking in the virtues which have been ascribed to them. In support of this statement he cited the failure of Chian turpentine to produce a cure in carcinoma, although at one time highly lauded. He deplored the employment of such new and popular remedies, when other and thoroughly tested drugs are ignored or used only as a last resort. He argued that if the profession employ legitimate medicines in cases of extremity, why should they not all the more be employed in conditions of lesser gravity. While admitting that elegant pharmacy has been an acceptable outgrowth of the efforts of manufacturing pharmaceutists, and that the elixir and the coated pill are great improvements over the tincture and the old-fashioned pill, he feels that the physician deserts scientific medicine when he permits the druggist to delude him into believing that his combinations, in association with some pleasing vehicle, are more valuable than the physician's prescriptions.

DR. A. B. BRUMBAUGH, of Huntingdon, followed with an "Address in Hygiene." He spoke of sanitary science as having found its way into the highest esteem of the profession. In reviewing the older theories and beliefs upon the various departments of hygiene, he said that the time was when clear water was regarded as pure and suitable for drinking purposes, simply because of its transparency, although it emitted an offensive odor; and formerly a single dip in the neighboring brook, once in a summer, was deemed all that was necessary to insure proper cleanliness of the skin with attendant good health. He urged that to insure a better professional understanding of hygienic subjects, the course of medical instruction should be lengthened, and a knowledge of the microscope more generally diffused. He deplored the fact that in this country the physician's preliminary course of education was too elementary. Prevention, he continued, is better than cure, and he who finds a way of preventing consumption will be greater than he who finds a cure for that disease. As regards the disposal of the dead, he emphasized the truth that cremation is the one practical solution to this question. The proper disposal of the excreta of the living is an equally vital subject, and thousands are dying from criminal neglect in regard to this. As cremation is the only proper method of disposing of the dead, so fire is the only thing which will remove this other great evil. He believes that the day may come when preventable sickness will be regarded as a crime.

The subject of "Tapeworm" was considered by DR. JOHN M. BATTEN, of Pittsburg. After reporting some cases he dwelt upon the question of treatment. Dr. Shaw, of Pittsburg, recommended a mixture of kamala, ʒj, and ethereal extract of male fern, ʒij, in one ounce of the syrup of acacia, the whole to be given in two doses, half an hour apart. Barclay, of the same city, has had success with chloroform where other remedies have failed. Allison recommended the cocoanut, while Camp preferred doses of castor oil, followed by ten or twelve-grain doses of thymol at intervals of fifteen minutes, the whole followed by a dose of castor oil. At the time of the expulsion, the patient should sit over a pail of warm water to facilitate the discharge. He believes that in cases difficult of expulsion the head of the worm is attached low down in the intestinal canal. Squibbs recommends the following mode of treatment: After fasting, the administration of a saline aperient (two Seidlitz powders) to produce a copious effusion of serous liquid, which will wash away the mucus from around the head of the worm. In the morning a second dose of the aperient should be given, and after the bowels are open, one-third of an emulsion—made by beating four ounces of pumpkin seed, including the shell, in water enough to make a pint—should be given, and at two hour intervals the remaining two-thirds, the whole fol-

lowed by a dose of oil. Should this fail, the oleoresin of male fern, in ten-grain capsules, may be used, two every three-quarters of an hour until eight or twelve have been taken. It was formerly supposed that the tænia solium was the most common variety of tapeworm in man, but it is now known that tænia saginata is most frequently found.

DR. TYSON, of Philadelphia, called attention to the exceeding rarity of the parasite. In his large practice, including a large dispensary practice, he met with about one worm a year. The tænia saginata is the most common form in this country, Dr. Leidy recently asserting that during the last fifteen years no other variety had been sent to him for classification. Dr. Tyson also spoke of the better success of quacks in the treatment of worms. He believed the reason to be that they treat enormous numbers of cases and give larger doses than the regular practitioner. With regard to the remedies employed, all are useful, provided there is proper preliminary treatment. It is most important that the previous purgation be decided. Kooso flowers have been very efficacious in his hands, given in one-ounce doses in water. Strüppel recommends pomegranate root mixed with ethereal extract of male fern as very valuable. Dr. Tyson has noticed that if two remedies are united they are more valuable.

DR. COOPER has had four cases of tapeworm in thirty-five years. He believes that the head of the worm is often imbedded in some pouch of the intestinal wall where the remedy cannot reach it, and hence the lack of success in treatment.

DR. EARLY has succeeded in dislodging worms by the employment of turpentine.

Adjourned.

WEDNESDAY, JUNE 3D.—SECOND DAY.

The meeting having been called to order at 9 A.M., the address on Mental Disorders was delivered by DR. SAMUEL AYRES, of Pittsburg, his subject being the "Gastro-intestinal Disorders, especially Catarrh and Hepatic Diseases, in their Relation to Insanity." He particularly enlarged upon some of the obscure causes of insanity, including the relationship existing between dyspepsia and melancholia. An unpleasant feeling in the body induces a corresponding feeling in the mind, and mental disorders are thus produced reflexly from physical indispositions. The alterations in the liver in these cases are chiefly those of chronic congestion. Catarrh is probably the chief cause of these changes, while in many cases there is a feature of heredity. As a result of this catarrh, noxious gases, especially sulphuretted hydrogen, distend the viscera, while ptomaines and microörganisms are generated. All of these, together with the leucomaines which are not properly eliminated, are absorbed. Toxæmia follows and is manifested by headache, vertigo, morbid thinking—the effects of the poisonous action upon the nervous system. Cathartics or diuretics generally avail to remove this condition, but let the toxæmia as well as the chronic congestion of the hepatic system continue, and failure of the emunctories to act, and nervous and mental disorders follow, often resulting in insanity and suicide. Acute mania and delirium may readily be explained on the hypothesis of infection from microbic action secondary to gastro-intestinal disorders. Prophylaxis is the leading indication in the treatment of this condition. The question of heredity must be considered, while special treatment of the catarrhal trouble should be instituted, especially associated with diaphoretic elimination of the putrefactive matter in the system.

DR. ISRAEL CLEAVER, of Reading, read an interesting paper on the "History of the Medical Profession in Berks County." He showed that Reading was the first place to welcome the present Association under the name of the Medical Society of Pennsylvania. Berks was the second organized county medical society in the State, Philadelphia alone antedating it. It has furnished two presidents to the State Medical Association, Dr. Easter, in 1856, and Dr. Wallace, in 1862. Thirty of its members served as surgeons in the Union army. It was organized with 22 members, and at present has 55 members. The profession is represented in the county by 289 regular, 42 sectarian, and 60 nondescript members. The record of disease shows some interesting facts. Malarial fever, formerly very prevalent in the county, gave place in the decade from 1850 to typhoid fever, which in turn disappeared during the last decade to make room for malaria again. The records of the County Society show reports of some extremely interesting cases, including a unique treatment of epistaxis by insufflations of charcoal from burnt cork.

"The Treatment of Subacute Pleuritis," was considered by Dr. J. M. ANDERS, of Philadelphia. He said that the therapeutics of the first stage of the disease embraced measures to limit the extent and diminish the intensity of the inflammation, and to remove the acuteness of the pain. If the temperature is high, and not associated with cachexia, veratrum viride and quinine are indicated. The effusion is the result of inflammatory action and not a mere transudation. So long as there is inflammation, as shown by the rise of temperature, there will be exudation, and the absorption of the latter begins with the defervescence of the temperature. To minimize the inflammation, an ointment of iodine ʒss, iodide of potassium gr. 15, and lanolin ʒj, should be rubbed into the side twice daily. Blisters and poultices should be eschewed. Owing to their depressing influence, antipyretics are injurious. Quinine, ten grains every two hours, should be administered. The removal of the effusion constitutes the other leading feature of the treatment, and this should be done only by the use of diuretics, such as the iodides of iron and potassium in combination, associated with a moderately dry diet. Diaphoretics are depressing, and purgatives are apt to be followed by alarming symptoms of collapse. Thoracentesis is indicated should the effusion persist a week after the defervescence of temperature. The amount withdrawn should not exceed one-half pint, but the tapping should be repeated every second day. During convalescence the strength of the patient should be stimulated by proper measures, the muscles toned up by the use of strychnine and electricity, with the sytematic use of the wall machine and parallel bars.

DR. TYSON prefers the employment of stronger counter-irritation in the form of blisters. In regard to paracentesis, the longer the lung is compressed the more difficult will it be for it to return to its normal condition, hence he favors early action, especially if pus be present. He

emphasized the value of lung gymnastics during convalescence.

DR. ROBERTS said that the danger in delay is mechanical. Early evacuation hastens the absorption of the fluid, and he operates irrespective of the temperature chart. He objects to the preliminary use of the hypodermatic needle, and to repeated tappings.

A paper on "Typhoid Fever" was read by DR. WILLIAM F. WAUGH, of Philadelphia, in which he laid stress upon the bacterial origin of the disease. As to therapeusis, he objected to all empirical management of the cases, and to the use of antipyretics in particular. Intestinal antisepsis is the only proper method of removing the cause of the disease. The good effect of the oil of turpentine is due largely to its antiseptic properties. The sulpho-carbolates, especially of zinc, are the most efficient of these intestinal antiseptics. He administers it in doses of two and a half grains every two hours until the stools are deodorized. The use of this drug is followed by an amelioration of all the symptoms, and the disease may even be aborted. In case of any complication it must be supported by the employment of other remedies.

CORRESPONDENCE.

ARTIFICIAL FEEDING.

To the Editor of THE MEDICAL NEWS,

SIR: The communication which I send herewith struck me as very interesting. I submit it to you for publication with the writer's permission. Very respectfully,

BARTON COOKE HIRST.

DR. B. C. HIRST,

DEAR DOCTOR: Your article in THE MEDICAL NEWS of January 31st attracted my attention by its title. . . . This is a subject I have thought of and worked on for ten years, and as yet have not been able to arrive at any satisfactory solution to the problem. I wish, however, to give you the advantage of a little experience I gained in Japan, as, though in itself it may be of little value, still if added to some experience of another observer, it might come into use. I went to Japan in 1884 as medical officer to the American Episcopal Mission. One of the first things I noticed was the immense amount of condensed milk imported there, and what astonished me was that it was mostly of American manufacture—"Gail Borden's Eagle Brand." I next noticed only one other brand in the market—"The Anglo-Swiss Milk." On making inquiries I found out that most of the children of foreigners—*i. e.*, Europeans and Americans residing there—were fed almost entirely on condensed milk. You will wonder at this, but it is owing to the following facts: The monthly nurses are Chinese women, who, realizing the fact that children come oftener when the women can be persuaded to have their breasts dried up, of course endeavor to do this and thus make business for themselves; they usually succeed in persuading the mother to abandon her babe to artificial feeding.

The next fact is that, as there are few unmarried ladies there, the dictates of fashion require married women to do all the entertaining, and to fill the place of the unmarried woman in society. Of course, it will not do for a society mama to have a turgid breast that must be relieved, to say nothing of a hungry, crying babe at home that needs feeding every three hours. Pursuing my inquiries further I found that over ninety per cent. of the children of foreigners born in Japan were brought up on the bottle. Being a new-comer, I took it for granted that in a hot climate, artificial feeding must produce a great deal of intestinal trouble, and expected to see much of it, but this was not the fact. On making inquiries of the leading physicians of Yokohama, Tokyo, Nagasaki, and Kobe, I found that such a thing as a death from summer complaint, or from other intestinal trouble brought on by improper feeding, was utterly unknown. The reason for this could not be explained. True, many of the children had slight, and some even very severe troubles of digestion, yet there were no deaths. The usual mode of administering the milk was by the bottle or cup, extreme cleanliness being observed. The rule of washing the bottle in strong bicarbonate of sodium solution was invariably observed, many people using a simple feeding-cup with a nipple on the spout, as it was easier to clean and required the child to be held each time it was fed, and of course was not so hard to draw from as the usual nursing bottle, because of its being open. Lime-water is usually used with the condensed milk. "The Eagle Brand" was noticed to be more constipating than the "Anglo-Swiss," but was less apt to be rejected by a delicate stomach. Ordinary cow's milk was used when a child was constipated, and after using the condensed milks it, in fact, acted as a laxative. Nestlé's food was used to a certain extent with older children, but the condensed milks were generally used for the first six months. The physicians disregarded the directions on the cans entirely, as the proportions given were much too strong. The children there are exceptionally strong and robust-looking. Such rosy cheeks and bright eyes were good to see. Of course, there is one factor to be considered; these children had parents who were picked for their strength. All of the mercantile and missionary corporations *require* a man to stand a good physical examination before he is allowed to go to Japan. The missionary societies require a certificate of robust health from the wives of their agents. Again, these people are all well-to-do. There is no foreign laboring class in Japan. The foreigners there are all either professional men or merchants and their clerks.

I remained in Japan six years, and was during that time in general and hospital practice, and in my own experience knew of no deaths from intestinal troubles among infants, though there were three epidemics of Asiatic cholera during that time. Dr. Duane B. Simonds, who had been a practitioner in Japan for twenty-six years, told me that he had never known of a death from artificial feeding. While children are exceptionally healthy there, adults are the reverse. Nervous troubles are particularly frequent. Wet-nursing was not much practised on account of the fear of syphilis, leprosy, tuberculosis and skin diseases. Parasitic diseases of all kinds are frequent among the lower classes of the natives. Filaria—distoma hepat. and pulmonal.—and guinea-worm are met with in Japan, and on account of the extensive use of human fæces as manure,

the round-worm is a usual habitant of the average intestinal tract. Yours very truly,

FRANK W. HARRELL, M.D.

SEATTLE, WASH., March 18, 1891.

CONCERNING A TWO-YEAR MEDICAL COURSE OF STUDY.

To the Editor of THE MEDICAL NEWS,

SIR: The last issue of your journal contains a remarkable plea for two years of undergraduate medical study as being more just and fair, and more effective in their results, than a three-years course. Dr. Young J. Bond, of St. Louis, in a truly disinterested manner, champions the cause of the brilliant but impecunious young man, and dwells upon the hardships three years compulsory attendance would inflict upon such a student. In conclusion, the writer favors the appointment of a State Board of Examiners.

As has been stated in a recent issue of your journal by Dr. C. A. Todd, of St. Louis, the physicians all over the State favored the passage of the bill on medical education before the last Legislature. The principal object of this bill was the raising of the standard of medical education, and the three-course requirement was one of the features of this bill. It was urged that inasmuch as similar laws had been passed in surrounding States, the enactment of this law would become necessary in order to protect our State from the influx of incompetent physicians from those surrounding States. The bill passed the House by a large majority, but the persuasive powers of the tongue (or the pocket-book?) of these disinterested champions of the brilliant but impecunious young man were responsible for its defeat in the Senate.

The fact that the brilliant young man is eminently well qualified to take care of himself seems to have been entirely lost sight of; as also the circumstance that the public in general is much more in need of protection against incompetent and ignorant physicians than the brilliant young man is in need of protection against the possibility of learning too much. It is reasonable to suppose that any young man can learn more in three years than he possibly could in two years, and no one can deny that even more than a three-years' careful study is needed for the acquirement of a thorough education in the different branches of medicine and surgery. I am persuaded that even the brilliant young man, with profit and benefit to himself and his future patients, can utilize three years in the study of the medical sciences. The physicians of this State are almost unanimously in favor of any measure that will insure every student a thorough qualification for his important life-work. If a State Board of Examiners will accomplish this end, we will certainly favor and urge the appointment of such a board. But it would seem that inasmuch as the members of such a board are appointed by the Governor, political influence might at times insure bad appointments, and in this manner even a State Board of Examiners might not prove an unmixed good.

The bill referred to was a step in the right direction, a step toward the securing of a State Board of Examiners, or any other measure having for its ultimate result the elevation of the standard of medical education, and those opposing it may proudly claim the questionable honor of having secured the defeat of the bill. H. H. V.

ST. CHARLES, MO., May 25, 1891.

FEL BOVIS.

To the Editor of THE MEDICAL NEWS,

SIR: In answer to the many inquiries which I have received as to the time of administering, and the preparation of "fel bovis" used, will you kindly grant me space in your columns to say: As a rule, the "fel bovis inspissatum" yields the best results in digestive disorders when given before each meal. As an antipyretic it should be administered every two or three hours. As to the preparation, great care should be taken to secure a fresh sample from any of the well-known manufacturers. The old and often decomposed "fel bovis" of the shops will prove a total failure, as has often happened to my patients. But when a fresh and undecomposed article was used, it has never failed to produce the desired result. "Fel bovis inspissatum," when in good condition, has a semi-solid consistency, and will rub up with glycerin into a smooth paste without frothing, but when altered by age, or impure in quality, this result cannot be obtained. WILLIAM HENRY PORTER, M.D.

OBITUARY.

DEATH OF FORDYCE BARKER.

ON last Saturday afternoon, May 30th, DR. FORDYCE BARKER died at his home in New York City, after a brief illness, his age being seventy-three years.

The death of this eminent member of the American profession calls for more than a brief notice. A native of Maine, and a graduate in Arts of Bowdoin College, his medical studies were pursued in Boston, Edinburgh and Paris; he received his degree in the city last named. He was made Professor of Midwifery in Bowdoin eight years after receiving his literary degree, holding this position until his removal to New York many years ago. For more than thirty years he was a medical teacher in the city of his adoption, occupying the chair of Clinical Midwifery and Diseases of Women in Bellevue Hospital College. He was an active participant in the meetings of various medical societies, and a diligent contributor to medical literature. The work upon which his fame chiefly rests, and which made him most widely known, both at home and abroad, is his volume upon *Puerperal Diseases*, published in 1874. It was his intention to collect some of his many fugitive contributions to medical literature, carefully revise them, and then have them issued in a single volume—indeed, a good deal of work had been done in the preparation of this proposed volume, which was to have been published by a well-known Philadelphia house, and the writer of this sketch had promised the distinguished author to exercise some supervision in its publication. It is cause of great regret that Dr. Barker died with this purpose unaccomplished.

As a practitioner in obstetrics, as a teacher of his favorite department of medicine, and as a writer, he had no superior upon the continent—hardly an equal in any,

certainly not in all of these functions. His authority in obstetrics scarcely anyone would be bold enough to challenge, and, in the main, his teaching was true and wise; in a very few things he was slow to fully accept recent views, clinging with great tenacity to some old theory or hypothesis, as, for example, that puerperal fever was in some cases an essential disease.

Dr. Barker's kindness to the younger members of the profession, generously giving a helping hand to the worthy who were struggling up the slippery steps to firm position, must be reckoned as one of his marked characteristics. His earnest and zealous efforts for professional advancement were well known and usually successful. His social and professional relations with many of the wealthiest citizens of New York enabled him to awaken warm interest in, and secure generous contributions for, different objects of professional concern and for important charities. His loyalty to his friends was generally known. His generous hospitality was proverbial; he was a perfect host, seeing that no guest was unnoticed or uncared for. His conversation was not only instructive, but delightful. No one could listen to his words upon professional subjects, whether uttered at his home or in societies, without becoming wiser for his wisdom, and deriving practical lessons for his daily work. Probably Dr. Barker's most valuable contributions to professional knowledge, independently of his medical teaching, were made in the New York Academy of Medicine and in the American Gynecological Society, of which he was one of the founders and the first president. For many years he suffered from a laryngeal disorder, certainly for thirty years, over which the writer's acquaintance with him extended, and utterance was difficult and only understood when most carefully listened to; but wherever he spoke, whether in societies, at home or abroad, every hearer gave strict and constant attention, and felt abundantly rewarded. His abilities and his work brought him great recompense, not merely in a most lucrative practice, but more and higher, in fame and honors. Among the latter must be mentioned his having the degree of LL.D. twice conferred upon him by British universities, the last time by that of Glasgow.

We may murmuringly ask why a man, so great and good, capable of doing such great and good things for his profession, might not, with eye undimmed, natural strength unabated, and in the vigor of his intellectual powers, have been spared a little longer to continue his noble work. Nay, rather let us rejoice that such a man has lived and labored, bringing honor to medicine and glory to the American profession. But he did not belong exclusively to this country, for no American physician had greater European fame. How often one of the first questions asked of a doctor from the United States, when he was in Great Britain or on the Continent upon his summer vacation, was, "Is Barker coming over?" Loved by friends who knew him best, admired and honored by all, at home and abroad, he rests from his labors, but his memory and fame live, and will live, probably longer than those of any other American obstetrician of this or of any other century.

The funeral services, on Tuesday afternoon, June 2d, in the Episcopal church of St. Thomas, of which the deceased had for many years been a member, were conducted by Bishop Potter and Rev. Dr. Morgan Dix, and were impressive. The auditorium was filled with representatives of the medical, legal, and clerical professions, as well as of the social, the commercial, and the industrial life of the city of New York; physicians of Philadelphia, Boston, and New Jersey were also present. The remains were taken to Norwich, Conn., for burial in the cemetery in which Dr. Barker's father and his daughter, who died in childhood, were interred. Dr. Barker's wife and son, Fordyce Barker, are the only members of the family living.

DEATH OF DR. JAMES W. WHITE.

ON Wednesday, May 27th, DR. JAMES W. WHITE, long known to Philadelphians as a philanthropist and successful business man, died suddenly of cardiac disease. During the war Dr. White was an active member of the Sanitary Commission, and since then has been constantly engaged in charitable and beneficent pursuits. His connection with the Maternity Hospital in this city consisted in more than the mere perfunctory position of manager, and his office of President of the Board of Charities gave him still further opportunities for the exercise of many kindly traits.

Firm in his opinions as to right and wrong, fearless in the discharge of every duty, kind to the young man and gracious to his colleagues, Dr. White leaves a blank in the city life which many must regret.

NEWS ITEMS.

Dr. Wyman—the Surgeon-General of the Marine-Hospital Service.—Dr. John B. Hamilton has resigned the position of Surgeon-General in the Marine-Hospital Service to accept the chair of Surgery in the Rush Medical College of Chicago. Dr. Walter Wyman, who had for a long time been the assistant to Dr. Hamilton, was, upon the recommendation of the latter, appointed by the President to fill the vacancy. Dr. Wyman is forty-two years old, a native of St. Louis, and a son of the late Edward Wyman, widely known as an instructor.

He graduated from Amherst College in 1870, and from the St. Louis Medical College in 1873. After serving for more than two years in the city hospitals of St. Louis and engaging in private practice, he was, in 1876, appointed Assistant Surgeon in the Marine-Hospital Service and placed in charge of the Marine Hospital at St. Louis.

In 1879 he was transferred to Cincinnati, and for three years remained in charge of the service there, temporarily acting as Surgeon of the U. S. revenue cutter "Chase" (cadet ship) on her annual cruise to Spain and the Azores in 1881.

In March, 1882, he was placed in charge of the Marine-Hospital Service at Baltimore, and in November he was detailed as Medical Inspector of the crews of the Life-saving Stations on the New Jersey coast.

Between December, 1884, and June, 1885, he visited the principal hospitals and laboratories of Europe and pursued studies in Vienna. On his return he was assigned to the command of the service at New York, remainining three and a half years, when he was ordered to Washington as Medical Purveyor and Chief of the quarantine division.

During the absence of the Surgeon-General in Europe last summer and fall, Dr Wyman was in temporary charge of the bureau. On the return of the Surgeon-General, an additional officer having been detailed at headquarters, Dr. Wyman was relieved of the purveying division, and assumed charge under the Surgeon-General of the National Quarantine Service and the publication of the *Weekly Abstract of Sanitary Reports.*

In the fall and winter of 1890, Dr. Wyman made an inspection of the quarantine stations of the Atlantic and Gulf coasts from the Delaware Breakwater to New Orleans, and visited Havana to familiarize himself with the local conditions of this perennial menace to the health of the United States.

Dr. Wyman is an active member of the American Public Health and American Medical Associations and was secretary of the Section of Public and International Hygiene in the International Medical Congress in Washington in 1887.

He is the author of a number of published papers on matters relating to public health, the most recent being an exhaustive article on "Quarantine" in *Rohe's Textbook of Hygiene.* Other articles are: "Hospital Records, with description of a New System;" "Hospital Management;" "River Exposure and its Effect upon the Lungs;" "Hygiene of Steamboats on Western Rivers;" "Hardships of the Chesapeake Bay Oystermen;" "System of Sewerage Disposal in Berlin;" "Treatment of Cholera by Paris Physicians in 1884;" "Government Aids to Public Health."

University of Pennsylvania.—The Trustees of the University of Pennsylvania have elected—Dr. George A. Peirsol, Professor of Anatomy; Dr. Harrison Allen, Professor of Comparative Anatomy; Dr. John B. Deaver, Assistant Professor of Applied Anatomy; and Dr. Edward Martin, Clinical Professor of Genito-urinary Surgery.

New York Post-Graduate Medical School and Hospital.—At a recent meeting of the Directors of the New York Post-Graduate Medical School and Hospital, H. J. Boldt, M.D., was made Professor of Diseases of Women; William James Morton, M.D., Professor of Electrotherapeutics, and Aug. Caillé, M.D., Professor of Diseases of Children.

Resolution on the Death of Dr. Fordyce Barker.—The Medical Board of the New York Maternity Hospital adopted the following resolution:

"*Resolved*, That by the death of Dr. Fordyce Barker, consulting surgeon to the hospital, we have met with the loss of a warm personal friend, as well as of a valued counsellor. Although unable, by reason of increasing infirmities, to take an active part in the work of the hospital, his interest in its welfare and in the branch of medicine in which he was so eminent never abated.

"In common with the whole profession we cherish his memory as that of a wise physician and a good man, who died full of years and honors."

The Medical Examiner.—This new journal was launched at New York City, April 1, 1891, as a proposed organ for medical men who are engaged in life insurance, accident assurance, prudential relief, pension matters, railway surgery, the army, the navy, and as police surgeons. It will appear monthly. Dr. George W. Wells will be its editor.

Long Island College Hospital.—The Long Island College Hospital has made the following interesting changes in the course of its instruction and in its faculty:

1. The regular course of lectures will hereafter be six months in duration.

2. Three courses of lectures will hereafter be required for graduation.

3. Joshua M. Van Cott., Jr., M.D., has been appointed Professor of Histology and Pathological Anatomy, *vice* Frank Ferguson, M.D., who has resigned.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM MAY 26 TO JUNE 1, 1891.

CARTER, EDWARD C., *Captain and Assistant Surgeon.*—Will proceed, without delay, to Fort Canby, Washington, and report to the commanding officer for temporary duty, relieving John D. Hall, Major and Surgeon, who will proceed to Fort Sherman, for duty as Post Surgeon.—Par. 1, *S. O. 74, Department of the Columbia,* May 22, 1891.

By direction of the Secretary of War, JEFFERSON R. KEAN, *Captain and Assistant Surgeon,* is assigned to temporary duty at Fort Myer, Va, until the return of Robert H. White, Major and Surgeon, to duty at that post.—Par. 8, *S. O. 122, A. G. O.,* May 28, 1891.

WATERS, WILLIAM E., *Major and Surgeon.*—Is granted leave of absence for twenty days.—Par. 6, *S. O. 122, A. G. O.,* May 28, 1891.

By direction of the Secretary of War, leave of absence for three months, on surgeon's certificate of disability, is granted MARLBOROUGH C. WYETH, *Captain and Assistant Surgeon.*—Par. 6, *S. O. 119, A. G. O., Washington,* May 25, 1891.

BROWN, PAUL R., *Captain and Assistant Surgeon.*—Is granted leave of absence for one month, with permission to apply for an extension of one month.—Par. 4, *S. O. 59, Department of the Missouri, St. Louis,* May 26, 1891.

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE-HOSPITAL SERVICE, FOR THE TWO WEEKS ENDING MAY 23, 1891.

VANSANT, JOHN, *Surgeon.*—Granted leave of absence for seven days, May 22, 1891.

IRWIN, FAIRFAX, *Surgeon.*—Granted leave of absence for twenty-one days, May 11, 1891.

GUITERAS, G. M., *Assistant Surgeon.*—Relieved from special duty at New York, N. Y.; ordered to San Francisco, Cal., May 11, 1891.

GROENEVELT, J. F., *Assistant Surgeon.*—Relieved from duty at New York Marine Hospital; ordered to Gulf Quarantine, May 22, 1891.

YOUNG, G. B., *Assistant Surgeon.*—Granted leave of absence for thirty days, May 11, 1891.

PROMOTIONS.

PERRY, T. B., *Passed Assistant Surgeon.*—Commissioned as such by the President, May 23, 1891.

WOODWARD, R. M., *Passed Assistant Surgeon.*—Commissioned as such by the President, May 23, 1891.

COMMUNICATIONS are invited from all parts of the world. Original articles contributed exclusively to THE MEDICAL NEWS will upon publication be liberally paid for, or 250 reprints will be furnished instead of payment, provided that the request for reprints be noted by the author at the top of the manuscript. When necessary to elucidate the text, illustrations will be provided without cost to the author.

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